TEXTILE TECHNOLOGY DIGEST

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Abstracts

(An explanation of the classification used in the Digest was published in the January (1949) issue (Vol. 6, No. 1) on the page facing the Index to Authors)

FIBERS A

Natural fibers A 1

An aid to the measurement of fiber diameter

P. Larose. *J. of Textile Inst. 42*, P104-6 (Mar. 1951).

A description of the method used in the measurement of fiber diameter wherein the fibers are oriented so that they all lie in the same direction. This is accomplished with the aid of an electric field (A.C.).

Consider these points if you're handling cashmere

Gustav Zellnik. *Textile World 101*, 139, 220 (May, 1951).

The origin of cashmere fiber is outlined, along with annual production figures for Chinese, Iranian, and Tibetan cashmere. Details of harvesting, differences between the three types of cashmere mentioned above, fiber yield, physical and chemical properties, and suggestions on carding, spinning, and weaving cashmere textiles are reviewed.

Cotton classing system

Staff. *Textile Industries 115*, 147, 149, 151, 155 (Apr. 1951).

All of the cotton buying for five mills of M. Lowenstein & Son, Inc., is done by an organization known as Central Mills Purchasing which, through a scientific and efficient system, has produced major savings for the mills in purchasing costs. In addition cotton most suited to the mills needs is obtained for each individual mill. Actual purchasing is by grade and general specifications. Samples are sent by the shipper to Central Mill Purchasing where expert cotton classers examine them. Those samples which comply with specifications are accepted, and the bale numbers are sent to the shipper who then ships the bales to the specified mill. Samples from these bales are also sent by the mill to Central Mill Purchasing for classing. Accurate and complete records are kept at Central Mill Purchasing not only of the cotton classed but also of the exact inventory of each mill in the group. The classing of the cotton is done as accurately as possible with 3 different grades (plus, minus, and on the head) determined within one class. To accomplish the accurate classing the most ideal conditions practical in the classing room are offered.

Production of wool-like filaments

Marcel D. Debouteville. USP 2,549, 179, Apr. 17. 1951.

Filaments resembling wool in having hooks or scales are produced by extrusion through a nozzle while vibrating the system in a particular manner.

Relative Humidity important in processing of wool fibers

H. R. Rich & N. B. Chase. *Textile World 101*, 118-119 (May, 1951).

When humidity is controlled during wool processing, the following advantages are said to be obtained: decreased amounts of emulsion necessary; static electricity is eliminated; amount of processing fly is decreased; machine efficiency is increased; and more accurate counts and weight control is obtained.

To get the most from cotton-fiber properties

Anon. *Textile World 101*, 116-117 (May, 1951).

An extract from a preliminary report of cotton grown on the Blacklands of Texas, released recently by The Cotton Research Committee of Texas, stating that Blacklands usually produce lint 5,000 pounds stronger than identical varieties grown in states east of Texas, though somewhat shorter in staple length as a result of differences in growing conditions. Consequently 1 1/32 in. Blacklands cotton can be substituted for 1 1/16 in. cotton grown in areas with greater

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rainfall. When properly selected for strength, Blacklands cotton can be purchased with savings of $3.00 per bale at present prices. The article describes the effects of rainfall and other growing conditions upon fiber properties, noting that, although Blacklands cotton is somewhat shorter than the same variety grown east of Texas, its fiber tensile strength is greater.

Studies by the research organization show that a change of 1/32 in. in length of staple usually results in a change of 2.6 pounds in the skein-breaking strength of 22s yarn. A change in tensile strength of 1,000 pounds per square inch of fiber usually shows a change of 0.86 in the strength of 22s yarn. Thus, a 31/32 in. cotton with a tensile strength of 5,000 lb. greater than that of a full 1-in. cotton could make a yarn of greater breaking strength than the longer cotton.

The strength and weakness of cotton fibers

Helmut Wakeham & Nancy Spicer. *Textile Res. J. 21,* 187-94 (Apr. 1951).

The structural reversals in cotton fibers are a preferred location of break when the fiber is ruptured in tension. With the aid of a polarizing microscope, observations were made of the fraction of fibers breaking at the reversals under various conditions of moisture content, specimen length, and chemical treatment. It is concluded that the cellulose in the region of the reversals is more highly crystalline than the cellulose between the reversals. The cause for breakage at the reversals is then explained on the basis of internal stresses at these points which cause the fiber to tear apart when tension is applied. The weak places between reversals which give rise to fiber rupture are believed to be at structural defects or thin places.

Artificial fibers A 2

Hardening synthetic protein fibers

H. G. Frolich. *Melliand Textilber. 32,* 136-40 (Feb. 1951) ; *in German.*

The author describes the reactions that might possibly take place in hardening synthetic protein fibers with formaldehyde, detailing the nature of the possibilities of reaction with the individual active groups of the protein fiber. He points out that the primary amino groups, the acid amine groups offer the chief points of attack for formaldehyde, whereby the methylene or axymethylene bridges show varying stability, which can be still further improved by special

after-treatment. The article concludes with a description of the reaction possibilities of the carboxyl group with metal salts.

Manufacture of textile fibers composed of casein

Antonio Ferretti. USP 2,548,357, Apr. 10 1951.

Process for manufacturing casein textile fibers comprising the wet spinning of the casein solution into a coagulating bath free of formaldehyde to form casein filaments; and, after removal from the bath, treating such filaments in at least one bath containing a substantial concentration of urea, but being free of formaldehyde, whereby uncondensed urea penetrates the filaments and is absorbed therein, the urea bath containing at least one non-basic soluble salt rendering the bath substantially saline and thereby functioning to a degree sufficient for the protection of the filaments ganst dissolving into such bath; and thereafter removing such urea-containing filaments from the urea bath and treating the same in at least one urea-free formaldehyde bath of saline character for insolubilizing same.

Some fundamental problems in the production of a synthetic wool

R. W. Moncrieff. *Textile Recorder 68,* 105-106 (April, 1951).

The article outlines the difficulty facing the fiber synthesist in any attempt to produce a synthetic wool fiber. The chemical and physical aspects of the problem are discussed in detail, along with the question of the most suitable raw material for the synthetic wool fiber. Basically, the problem of duplication is one to produce a fiber having two sets of characteristics which chemically are distinct and normally belong to two separate classes of substances. Wool is said to possess a multiplicity of reactive chemical groups which enable it to be dyed easily and which give it a high moisture content which makes it comfortable in wear and easy to wash and iron. Yet, wool fibers on the other hand show considerable resistance to wetting, and good strength in water.

Studies on modified viscose

Alexander Meller. *Tappi 34,* 171-79 (Apr. 1951).

Modified cellulises prepared from cotton fibers by means of periodic acid, potassium dichromate, and sulphuric acid, respectively, were found to be sensitive to hot alkali as indicated by the large loss in weight observed on their heating with

weak alkali solution. Cold alkali stability of modified celluloses is possibly more dominantly governed by factors relevant to supermolecular structure, degree of polymerization, and presence of chemically modified groupings and less influenced by carbonyl groupings. Many of the modified celluloses showed a higher solution viscosity in cuprammonia resulting from oxidation by chlorous acid. This higher solution viscosity in cuprammonia seems to be due to the presence of groupings of greater stability toward alkali and hence toward cuprammonia solution. Some implications arising from the stabilized modifications of cellulosic fibers in their practical uses are also briefly outlined.

YARN PRODUCTION B

Fiber preparation B 1

Continuous Woolen blending

Anon. *Textile Record 78,* 1747-1748 (June 8, 1950).

Various methods of blending wool fibers have been evolved: the hand-mix system, the sandwich mix method, the Proctor and Schwartz semi-automatic system, the English semi-automatic method known as the Oddie-Radcliffe continuous woolen blending system, and others. The article gives details of methods of preparing the material, oiling, and processing.

Dusting cotton bales

R. G. Shepherd and W. E. Peterson. *Textile Industries 115,* 147, 149, 151 (May, 1951).

See front section.

More on uneven picker laps

Staff. *Textile Industries 115,* 171 (Apr. 1951).

Continuing the discussion on picker laps, a contributor suggests increasing the lap weight per yard from 14 to 16 ounces since tests in the past show that with heavier laps there is less variation. Fans should not be operated at the same speed for all beaters since there is a possibility that stock is being placed on the screens in wads; and dampers should be checked because if they are worn or not properly set, cotton may be sucked into the dust house. Checking of the slats and pins of aprons; screens for rough, broken, and bent places; screen bearings and gears; the belt dressing on even belt; worn places on evener cones; operation of the eveners; and the feed mechanism are other places that are important in obtaining even picker laps.

Spontaneous heating of woolen blends

Anon. *Textile Record 78,* 179-181 (July 20, 1950).

Spontaneous heating of oily wool sheeted up after blending is a common occurrence. The heating effect is cumulative, due to chemical reaction. Spontaneous heating may be due to one of two main causes: 1) presence of excess water with unscoured wool, or scoured wool which has been over-dried; 2) the use of an unsuitable wool oil. Scientific selection of proper oils have reduced the occurrence of spontaneous heating. Oxidation is complicated because there are anti-oxidants as well as pro-oxidants. The function of anti-oxidants is to give added protection to the best oils available in the industry.

Carding and combing B 2

Cutting down waste in carding

Anon. *Textile Mercury & Argus 124,* 443, 444 (March 16, 1951).

One of the major problems in carding is the variation in efficiency which occurs immediately before and after the stripping of the cylinder and doffer. In addition, there is a production loss while the card is stopped during stripping operations. A new device, the continuous stripper made by Cia. Ama Constant Card of Barcelona, Spain, eliminates these disadvantages and maintains wire in good condition.

Fiber distribution in the sliver

Helmut Kob. *Textil-Praxis 5,* 214-16 (Apr. 1950).

A description is given of a new graphical method for analyzing the number of fibers of different length to be found in a given section of sliver or spun yarn, this section being the distance between the drafting rollers or any desired cut from the yarn. The method shows the relationships between staple diagrams, the drafting process (the influence of floating fibers), and fiber length distribution.

How much work does each flat do?

E. H. Helliwell. *Textile World 101,* 145 (May, 1951).

An experiment on the revolving flat card indicates that a flat is loaded with fiber when it reaches the position of the tenth flat. It continues to pick up trash until it leaves the bend. Chart shows weights of individual strips removed from the flats. Experiment was made by winding the flats forward and moving the cylinder by hand.

The carding of nop yarns

Anon. *Textile Record 78,* 1999-2001 (June 29, 1950).

Nop yarns are used for decorative effect in Cheviot and Saxony qualities. The nops may be of the same color as the ground yarn, or they may be dyed prior to blending so that they have a different color from the ground. The first type is made by using the carding crossbred, with Cheviot wools, and suitable alterations of scribbler, doffer, fancy, and workers. The settings of these parts are given by gage number or in inches.

Wool carding— ways to control eveness

W. J. Crofts. *Textile Industries 115,* 140-3, 145 (Apr. 1951).

Inefficiency in spinning and weaving, unevenness in cloth weights, and "rowey" cloth may be caused by poor carding since the size of woolen yarn is largely determined during the carding operation. The causes of uneven roving are very numerous and varied, and probably the most important single factor in producing good woolen yarns is good machinery maintenance. The condition of the cylinder and doffer rolls is very important, and faulty operation of the automatic feeder will contribute to uneven wool being produced. The scale pan should be balanced and time required to fill the pan should be checked. Spikes in the spike apron should be kept clean of stock, the comb should operate correctly. Also the receiving apron should be checked for any slippage. Other pointers that should be checked to obtain even roving include the feed rolls, licker-in, card wire and clothing, tapes, moisture content, finisher card, etc.

Drafting and roving B 3

Flyer for textile machines

Walter Hartley. USP 2, 549,599, Apr. 17, 1951.

In a socketed flyer for textile spinning machines, a plate disposed diametrically within the central bore of the flyer socket, the plate having an opening at its center portion through which the roving is passed before it passes out of the socket, the top edge of the plate being externally rounded at central portion thereof thereby to impart to the roving a greater degree of twist as it passes from the flyer socket.

Importance of good cleaners on fly frames

Staff. *Textile Industries 115,* 175-7 (Apr. 1951).

Cleaners on both drawing and fly frames serve not only to pick up lint, trash, and short fibers from the stock but also to collect roving waste when an end breaks. The type of covering or cleaner cloth is important and is usually a heavily napped heavy woolen fabric. When the nap begins to wear off or if the clearers become soiled, the clearers should be recovered. Operators should check the condition of the clearer cloth since a specific schedule would not apply to them. A regular schedule, however, should be adopted in picking clearers, and a suggested schedule consists of picking both bottom and top clearers each time the frames are doffed. Pressure on the clearer should be the same at both ends, and correct weights and good leather straps are also important.

Roving frame stop motion

Staff. *Textile Industries 115,* 93 (May, 1951).

See front section.

Spindle and bobbin shaft mounting for roving frames

Jesse B. Goodgame (to Precision Gear & Machine Co. Inc.) USP 2,551,210, May 1, 1951.

The patent describes an improved mounting for the bolster shafts and spindle shafts comprising a plurality of bearing blocks secured to the bolster rails and spindle rails and each of the bearing blocks secured to the bolster rails and spindle rails and each of the bearing blocks having a ball bearing therein, the ball bearings having the respective spindle shafts and bolster shafts rotatably mounted therein.

Spinning B 4

Ambler Super-Draft system now available in U. S.

Staff. *Textile Industries 115,* 107, 191 (Apr. 1951).

The Ambler Super-Draft system, a high drafting mechanism developed in England for drawing and spinning worsted and synthetic yarns, is now available in the United States from McGlynn Hays Industries, Inc. The system may be applied to either new spinning equipment or to existing machines on a conversion basis. This machine is designed to provide unlimited draft settings from a draft of 20 to 200 with change of draft obtained by merely setting a dial and no change of draft gearing is required. Satisfactory drafting is said to be conditional on the correct placing of the unit relative to the front rollers which is readily adjusted by a crank so that all

units are moved uniformly. It is reported possible to spin coarse wools, mohair, long staple synthetics and blends, finest quality wool, and short staple synthetics on the same machine. A complete description of the drafting system is given.

Drafting mechanism in spinning or like machines

Joseph Noguera (to Casablancas High Draft Co. Ltd.) USP 2,548, 232, Apr. 10, 1951.

A roller weighting device for drafting mechanism in spinning and like machines having at least three consecutive pairs of drafting rollers, the device comprising a first saddle adapted to bear on the top drafting rollers other than the front top drafting roller, a second saddle adapted to bear on the front top drafting roller and upon the first saddle and being capable of rearward displacement to free the front top drafting roller, means for transmitting a weighting pressure to the second saddle and means on each saddle which can be inter-engaged, when the second saddle has been displaced rearwardly to free the top front roller, whereby the second saddle continues to apply weighting pressure to the first saddle when in the rearward position.

Dust and lint blower for spinning frames

Luther Y. Herren. USP 2,549,601, Apr. 17, 1951.

In a dust and lint blower for spinning frames having a driven cylinder and a spindle, a supporting bracket rigidly secured to the lower portion of the frame, an arm pivotally mounted to the bracket and extending inwardly of the spinning frame, a fan having a pulley operatively connected thereto and mounted for rotation on the arm, and a flexible drive member passing around the spindle, cylinder and pulley.

Effect of twist on processing characteristics of a yarn

K. Ludwig. *Textil-Praxis 5,* 216-19 (Apr. 1951); *in German.*

An outline is given of the effect of the degree of twist on the characteristics of staple and filament yarns, which are treated in greater detail. The many factors conducive to variations in twist are indicated. The different degrees of twist required by the various applications of filament rayon, for example, crepeing, are discussed, and their preparation and behavior are described.

New yarn from United Merchants' patent

Eric E. Weiss (to United Merchants & Mfrs., Inc.) USP 2,526,523, Oct. 17, 1951.

See front section.

Prevention of fly accumulation

Anon. *Textile Mercury & Argus 124,* 441, 442 (March 16, 1951).

A description of the Parks-Cramer system of traveling cleaning, familiar to American mills, but now being introduced to British spinners.

Ring frames altered to put more yarn on bobbins

Staff. *Textile Industries 115,* 167, 169 (Apr. 1951).

Upon buying some new spindles, a contributor found, that the length of yarn wound on the bobbins was not adequate. To put more yarn on the bobbins it was decided to increase the length of stroke or lift by raising the drafting arrangement. This was done by placing makeup blocks 1″ thick between the roller beam and every "spring-piece" except those at the gearing and off ends and 1″ wooden blocks under the feet of of the gearing and off end. Tin roller bearings 1″ lower were installed, and the bottom carrier wheel was changed for one of 1″ greater dimaeter. The rocker movement was divided on the horizontal by putting a ½″ spacer in the foot of each poker. The stroke was thus increased from 7 to 8 inches and the yardage per bobbin raised over 18%.

Saco-Lowell direct spinner

Albert K. Cocke, Nancy P. Crowe & Rudolph Woodell. *Textile Res. J. 21,* 248-55 (Apr. 1951).

The character and sources of denier nonuniformities in "direct-spun" yarn were investigated. A simple modification of the direct spinner, known as the "angled, high-speed apron", was developed to control the breaking of the filaments over a short region near the input rolls. This simple change in the path and speed of the apron increased the average length of the broken filaments; increased the strength, elongation, and long-length uniformity of the yarn; improved the appearance of the fabric; and made possible for the first time the production of uniform, fine-count, direct-spun yarns. In order to be effective, the speed of the angled apron had to exceed a critical value that was shown to depend upon the front-roll speed and the position of the apron with the ratch.

Spinning machine

Oswald Lambert. USP 2,548,610, Apr. 10, 1951.

A spinning machine, comprising a delivery

cylinder, a downwardly enlarged hollow cone, means rotating the cone, a spindle, a conical portion on the spindle, the transverse dimension of the conical portion decreasing along the length of the hollow cone progressively from the upper end of the spindle from a maximum down to the spindle body diameter, means for rotating the spindle without axial displacement independently of the hollow cone, a guide tube spindle, a thread guide, means for rotatably driving the guide by the cone, and means imparting to the guide an up and down movement parallel to the axis of the spindle.

Traverse motion drive for spinning and twisting frames

Jesse B. Goodgame (to Precision Gear and Machine Co.) USP 2,548,719, Apr. 10, 1951.

In a spinning frame, twister and the like having a head end member and being provided with a main drive shaft and a rotatable shaft rotatably mounted in the head end member, the spinning frame also having a builder motion cam fixedly mounted on the rotatable shaft and being provided with a builder motion having means thereon for engaging the builder motion cam, the spinning frame also having a pair of stub shafts thereon provided with a pair of intermeshing interim gears mounted thereon, a change gear bracket having a fork on one end loosely engaging one of the stub shafts, the other end of the change gear bracket having a U-shaped portion being provided with a spur gear and a sprocket wheel rotatably mounted thereon, the U-shaped portion of the change gear bracket also having wing portions integral therewith and being provided with an arcuate slot, means secured to the head end member and projecting through the arcuate slot for adjustably securing the change gear bracket to the head end member, a driving connection between the interim gear having the change gear bracket engaging its stub shaft and the sprocket wheel mounted on the change gear bracket, means connecting the sprocket wheel with the change gear, a lay compound gear meshing with the change gear, a series of sprocket wheels and sprocket chains connecting the lay compound gear with the rotatable shaft having the builder motion cam thereon, and means for transmitting rotation from the main drive shaft to the interim gears to, in turn, transmit rotation to the builder motion cam.

Twister

Norman E. Klein (to Deering Milliken Res. Trust) USP 2,549,821, Apr. 24, 1951.

A multiple-twist type of twister in which the spindle is mounted above the package which is held stationary and about which the balloon is formed.

Worsted yarn manufacture I, factors influencing quality spinning production

Anon. *Wool Record 77,* 1443, 1445, 1447 (May 11, 1950).

Processes prior to spinning largely determine the uniformity of Bradford worsted yarn. The quality of scouring, carding, backwashing, combing, and drawing must be such that fiber length is conserved short fibers extracted, and enough doublings are made so that a uniform and sound roving is produced. Flyer, cap, and ring frames comprise the three methods of throstle spinning used in England; of which the flyer-spun yarns are said to have the highest standard of quality.

The factors considered as necessary to the spinning of sound, level, and uniform yarns on throstle spinning are: absolute trueness of all rollers; correct draft; correct setting of the ratch; and intermediate fiber control.

Worsted yarn manufacture II, quality production in twisting

Anon. *Wool Record 77,* 1523, 1525 (May 18, 1950).

Ring twisting is the final process in the manufacture of yarn in England. Insertion of twist, building the bobbin, slack twist, spindle bands, uniformity of twist, causes of variations, and the use of stop motions or detectors are described.

Yarn production

Robert J. Clarkson (to U. S. Rubber Co.) USP 2,550,136, Apr. 24, 1951.

A system for producing a ply strand using a plurality of multiple-twist type of up-twisters which are fed by independent feeding devices to a common doubling point and then collected on a multiple-twist type twister.

56 causes of tangled yarn—and how to remedy them

R. H. Pharr. *Textile World 101,* 127 (May 1951).

Causes of tangled yarn and their remedies are printed in chart form.

Winding and spooling B 5

Cross winding yarns on their supporting reels

Marcel Rouge (to Societe Rhodiaceta) USP

2,550,086, Apr. 24, 1951.

A device for producing cross winding of yarn, comprising a rotatable drum, a rotatable bobbin disposed adjacent to the drum for receiving yarn therefrom, means carried by the drum for directing the yarn in spiral layers alternately directed toward opposite ends of the bobbin, and pressure-exerting means, disposed between the drum and bobbin and in contact with the yarn along a predetermined line between the point where the yarn leaves the drum and the point where it engages the bobbin, the pressure-exerting means having a rectilinear yarn-contact surface tapered at opposite end portions thereof thereby to engage the yarn at different angles at opposite ends of the bobbin.

Pirn winding crepe and high twist combination yarns

H. Lasch. *Textile Manufacturer 77*, 168- 169 (April, 1951).

Overend winding of big supply packages of crepe or combination yarns is seldom done. Even in the United States, 90 percent of pirn winders used by rayon weavers are slow-running non-automatic machines using very small supply packages. Now, however, close study of the behavior of crepe yarns during winding has made it possible to devise a setup on the machine creels and tension units which permit the use of high-speed automatic winders, with resulting improvements in yarn quality over yarn wound by unrolling supply packages on slow machines. Photographs and details of the creel and tension setups are given.

Pirn or cone holder

Edward J. McBride. USP 2,549,618, Apr. 17, 1951.

A pirn or cone holder including a support, spaced heads, elongated members, secured to and connecting the heads, each of the heads having an opening leading from the periphery toward the center thereof, the openings in the heads being aligned and large enough to accommodate the support, and means for detachably securing at least one of the heads to the support.

Pneumatic rapid traverse for winding textile yarns on cones and tubes

Richard F. Dyer & Wendell G. Faw (to Eastman Kodak Co.) USP 2,548,523, Apr. 10, 1951.

In a rapid traverse winding apparatus for yarn, and the like, the combination of a rotatable winding-spindle on which a yarn winding member

is mounted for rotation, a pneumatically operated yarn guide mechanism positioned adjacent thereto and adapted to guide the yarn uniformly back and forth along the axis of the rotating member thereby permitting the yarn to be wound in uniform convolutions on the member, the yarn guide mechanism comprising in combination a yarn guide, a piston attached thereto, a tube in which the piston reciprocates, the tube having a longitudinal slit in the wall thereof through which the yarn guide extends and reciprocates with the piston, a valve block assembly mounted on one end of the tube having a valve chamber, a valve therein adapted to fluidly connect the valve chamber with the tube, means for supplying compressed air to the valve member, a similar valve block assembly positioned at the opposite end of the tube, the compressed air normally tending to hold the valves closed, the valves in the respective blocks being adapted to open and close alternately, the valves when in alternate open position, permitting the compressed air to flow from the chamber to the tube and to force the piston to and fro in the tube and to cause the reciprocation of the yarn guide associated therewith.

Winding and warping machinery

Anon. *Textile Mercury & Argus 124*, 545 (March 30, 1951).

A description of Schweiter winding and warping equipment as shown at the Swiss Industries Fair at Basle. Other equipment by Benninger, Brueger and Fisher in warping and weaving fields are also briefly reviewed.

Winding machine

Ben Carter & Eric Carter. USP 2,551,361, May 1, 1951.

A winding machine comprising a frame, a bobbin holder mounted on the frame arranged to receive and drive the bobbin to be wound, a guide mounted for reciprocating movement parallel with the axis of the bobbin for feeding the material being wound, and means for imparting step-by-step motion to the guide, a pivot receiving such rocker arm between the ends thereof to permit rocking movement of the rocker arm about the pivot, means for varying the position of the pivot relative to the frame for varying the traverse of the guide, means comprising a cam for imparting reciprocating movement to the opposite end of the rocker arm, means for imparting intermittent movement to the cam, and means for varying the distance of such movement.

Worsted yarn manufacture III, wrong knots and other faults

Anon. *Wool Record 77,* 1603, 1605 (May 25, 1950).

Poor yarn quality may be caused by mistakes or faults of operatives. The description of these faults include wrong knots, sticking bobbins, neutralized twist, faulty loops or spirals in twisted yarn. Suggestions for better operator supervision are made.

Yarn tensioning device for winding machines

George M. Brainerd & Aimee Vachon (to Barber-Colman Co.) USP 2,550,448, Apr. 24, 1951.

A winder having in combination, means supporting a bobbin to be unwound, a cheese driving drum, means supporting a cheese for swinging movement from an inactive position at one side of the drum into driving contact with the drum with a strand extending from the cheese to the bobbin, and means operative in such movement of the cheese for yieldably gripping the strand adjacent the bobbin, the last mentioned means including a stationary guide element, and a movable friction gripping element coacting with the guide element, the elements being adapted to release the strand upon the movement of the cheese into engagement with the drum.

Yarn processing B 6

Preconditioning of cotton yarn and tire cord

Walter S. Lewis. *Textile Res. J. 21,* 256-8 (Apr. 1951).

Cotton yarn and tire cord were preconditioned before testing breaking strength and elongation-at-break in order to determine to what degree these properties are influenced by prior moisture history. They are influenced by moisture regain so preconditioning is necessary. Tabular data is presented showing the breaking strength, elongation and moisture regain of samples preconditioned at 29, 60 and 80% R. H.

Yarn testing and numbering B 10

Cotton yarn irregularity

Anon. *Textile Weekly 47,* 912 (Apr. 6, 1951).

If the irregularities of cotton slivers, rovings and yarn prepared on the conventional low draft system are measured, it is found that irregularity usually decreases a little through the draw frames and then increases at an increasing rate as the material passes through the speed and

spinning frames until the yarn is many times more irregular than the finisher sliver from which it was made. From this two questions are posed: would the yarn be any more irregular if some of the machines were omitted, and what are the cause of irregularity?

Providing that drafting waves are the only important sources of yarn irregularity, yarns spun with high drafts and a smaller number of machines need be no more irregular than those spun on the conventional system with several speed frame stages. When, however, appreciable irregularity is being introduced by imperfections in the machinery, the irregularity is greater with high drafting. The higher drafts increase the amplitudes of the waves produced by imperfect rollers. They make roller vibration more likely; they cause reversal to be less effective, and so increase the final amplitudes of short-wave irregularities.

Extension and relaxation of nylon filaments

N. J. Abbott. *Textile Res. J. 21,* 227-34 (Apr. 1951).

Measurements were made of the extension of nylon filaments under conditions of constant load for various lengths of time in air at 65% R. H. and in water. The extent of the recovery which took place after removal of the load was observed, and its dependence upon the magnitude and time of application of load, as well as upon the immersion medium, was determined. Further recovery which could be effected by treatment with heat or swelling agent was investigated. Limitations in the use of terms "elastic limit" and "non-recoverable deformation" when applied to textile fibers are pointed out.

Importance of twist in yarns

Anon. *Textile Weekly 47,* 848 (March 30, 1951).

Twist inserted in yarns is the most controversial subject in spinning, which is the twisting together of comparatively short fibres to form a continuous strand. Spinning is simple, and has been done since the earliest times.

Now that we produce spun yarn better, faster, and cheaper by the application of mechanical knowledge, the effect of twist upon the yarn and fabric produced, the cost and quality, must be be studied carefully if loss is to be avoided.

In this study, the following things are to be considered: method of inserting twist; amount of twist; types of twist; object of twist; the cost of twist; variation in twist; and yarn contraction.

FABRIC PRODUCTION C

Yarn preparation C 1

A constant yarn speed beam drive

Anon. *Textile Mfr. 77,* 187 (April 1951).

See front section.

Controlling size pick-up

E. H. Hartgrove, Jr. *Textile Industries 115,* 157-8 (Apr. 1951).

Control of a size pick-up on cotton yarns in slashing will result in savings in starch used and a much more uniform and stronger woven product. Factors involved in size pick-up control include the number of the yarn being sized, per cent solids in the size solution, speed of yarn through slasher, temperature of size in the size box and the viscosity of the size in the box. To obtain controlled conditions at the size box, the viscosity in cooking and storing the size must be carefully controlled. Time and temperature in cooking are of utmost importance with 210° F. reported as the proper temperature for cooking starch. A viscometer should be used to determine when the starch is done, and care should be taken to keep the size at the proper temperature during storage. A simple method of testing size box viscosity consists of submerging a brass viscosity cup in the size and allowing it to remain there until it has reached the size temperature. It is then lifted from the size and the time required for the cup to drain is timed. A sketch of the cup is given together with a table for translating this period of time to viscosity in centipoise.

Employee suggests new type cone holder for processing rayon yarns

Staff. *Textile Industries 115,* 118 (April 1951).

A suggestion made by an employee of Cone Mills has eliminated the need for two sizes of cone holders on warper creels in processing filament rayon and spun rayon yarn which are processed on two sizes of cones. A holder to fit both sizes of cones was designed with a flange at the base to prevent either size cone from wobbling or slipping.

Why homogenization helps slashing and weaving

James H. Kennedy. *Textile World 101,* 130-31, 133, 135, 137, 218 (May 1951).

See front section.

Weaving C 2

Apparatus for mounting warp-stop detectors in looms

Henrich Meter (to Zellweger A. G. Apparate- und Maschinenfabriken Uster) USP 2,527,755, Oct. 31, 1950.

The invention describes improvements in apparatus for mounting stacked open-ended detectors on warp threads in looms.

Detector-mounting arrangements are known in the art, in which the divided detectors are caught in chutes from which they slide onto the warp thread brought or positioned underneath the chute outlet. Such gravity arrangements do not operate positively, as the detectors are not positively mounted onto the warp threads. The capacity and thus the efficiency of gravity arrangements, further, is limited insofar as the mounting rate depends on the time of drop required by each detector, which time is constant.

In other prior-art arrangements of this class, the warp threads divided from the warp are not positively separated, over the entire width of mounting, from the remaining threads. The divided thread, therefore, is not positively located, in particular not in case of crossed threads and/or a great number of detector rows, thus giving rise to the possibility that the detector to be mounted dro ponto the appurtenant guide-rod, and not onto the divided warp thread. Such missing detectors have to be remounted by hand, whereby the efficiency of the arrangement is impaired or jeopardized.

The object of the present improvement is to afford an apparatus which eliminates the deficiencies, by means of which the detectors are positively located or mounted onto the divided and properly positioned warp threads, whereby errors of mounting are eliminiated.

Comments on Card grinding practices

Staff. *Textile Industries 115,* 169, 171 (Apr. 1951).

Although grinding cycles usually vary with the type of stock and the weight of sliver, a cycle of 400 to 500 hours, as a general rule, is reported satisfactory between grindings. A heavy, fast grind may hook the wire which will cause excessive loading of the clothing. In addition, a fast grind has been found to put a flat point on the wire which wears out faster. On the other hand, if the grinding roll is operated at a slower speed, the wire tends to be pushed down by the grinder. An investigation of a

grinding roller, which was giving trouble in grinding and wearing out sooner than it should, found that the roller was running too fast. Larger pulleys put on the rollers cut the speed and increased the life of the rollers. Recommended practice for grinding cards is a light, slow grind at least once a month with a good grinding roller.

Fayolle-Ancet Loom

Anon. *Textile Mercury & Argus 124*, 447-448 (March 16, 1951).

A new circular loom by Fayolle-Ancet is now available in a narrow model for the jute bag trade. On a recent test, the loom ran at 160 picks per minute on jute bagging, with a warp breakage of only 1.5 per hour. The bagging requires only a hemming operation at the top. Mf'g agents: Muschamp Taylor Ltd., Pollard St., Manchester 4, England.

Fashion fabrics

Anon. *Textile Mercury & Argus 124*, 496 (Mar. 23, 1951).

British textile fabrics now stress such factors as novelty of construction, production, skill. Three patterns illustrate the article: (1) dress type crepe weighing 10½ ounces per yard at 54 inches wide, jacquard pattern. (2) the Ottoman fashion in a worsted and rayon cloth piece dyed for the wool content only, with the decorative content coming from a black and white rayon twist in both the warp and weft; (3) Tinsel cloth is an exceptionally interesting cloth of 11 ounces per yard, 54 inches wide, featuring a spun metal thread in the weft yarns. Loom construction is given for each of the three types.

Get that parts supply room in shape now

William A. Newell. *Textile World 101*, 110-112 (May, 1951).

Nine out of ten spare-parts orders received by machinery manufacturers are marked "Rush", indicating that parts-supply rooms in textile mills are not run as efficiently as they might be. Recommendations for good supply system and room are: 1) Number bins so that parts can be found as needed; 2) Assign parts to bins by make and motion or material; 3) Use the stock-record system showing a constant inventory of the parts; 4) Use formulas to determine minimum level of parts on hand, figuring average turnover, etc.; 5) Keep fixers out of supply room; 6) pick a good man to run the supply room; 7) Use machinery catalogs, government priority systems, etc.

Harness stop motion

Wilfred G. Jasmin & Lester G. Herlihy (to Bachmann Uxbridge Worsted Corp.) USP 2,550,195, Apr. 24, 1951.

In a textile device for operating on a travelling warp of yarns and including a plurality of harness frames, a head, and harness wires interconnecting the harnesses respectively and the head, means for stopping the device upon breaking of one of the harness wires the means comprising, a switch in a stop motion circuit including a plunger adapted when depressed to close the circuit, spring means urging the plunger to elevated open position, a bracket, and a switch operating arm extending over the plunger and pivotally supported on the switch operating arm and connected to it adjacent its other end and having a portion extending under the harness wires, guide means for holding the rod against lateral movement while permitting movement in a vertical plane, and counter-balance means on the rod, on the portion thereof which is opposite the connection between the rod and the arm from the portion extending under the harness wires, the effect of the counter-balance means and the spring tending to rotate the switch operating arm to keep the switch open being overcome when a harness wire breaks and falls on the rod causing the switch closing arm to rotate on its pivot in a direction to depress the plunger thereby closing the switch.

High production carpet Loom

Anon. *Textile Mercury and Argus 124*, 585 (April 6, 1951).

Platt's spool Axminster carpet loom has a number of special technical features to commend it. Incorporated in the latest high production model is the split shot mechanism first invented by T. Bond Worth and Sons Ltd., the well-known Stourport carpet manufacturers. The "Worth" mechanism permits all three shots of weft to be inserted in one operation, and as a result the productive capacity of the loom is between 25 to 33 per cent greater than anything achieved on earlier models.

Any carpet weaving process demands from the operative high technical skill, and as speeds are raised it becomes increasingly difficult—without undue fatigue—to give full attention to all details. To overcome this difficulty, Platt Bros. have developed a series of electrical stop motions, any one of which will bring the loom to rest immediately should there be any mechanical failure; breakdown of the warp, weft or selvedge

yarn; or any other accidental cause.

These electric stop motions make it possible for one weaver to attend two or more looms in the sure knowledge that a machine will stop automatically if attention is required. A bulb lights up and conveys to the attendant the exact cause of the stoppage.

Established in great numbers in the British carpet industry, in all widths from two quarters (18 inches) to 16 quarters (144 inches) wide, the loom has also had a favourable reception abroad and is being suplied to Sweden, Australia, New Zealand, South Africa and the U. S. A.

Machine checks tension of filling leaving shuttles

Anon. *Textile World 101,* 150 (May, 1951).

See front section.

Manufacture of pile fabrics and products thereof

Maurice A. Goldman (to Textron Inc.) USP 2,550,686, May 1, 1951.

The method of making a fiber product which comprises taking a layer of combed, unwoven fibers which preponderantly extend substantially longitudinally of the layer, applying to a surface of the layer a series of closely spaced apart, relatively thin and flat dots of thermoplastic material, and then anchoring to the dots along closely spaced parallel lines of attachment and with the aid of heat and pressure, spaced portions of a second layer of combed, unwoven fibers, the spacing between the parallel lines of attachment being substantially less than the width of the layer portions intermediate the lines.

Narrow fabric looms modified

Staff. *Textile Industries 115,* 135-6 (Apr. 1951).

At the new plant of Sullivan-Southern, Inc., in York, S. C., 36 old-style, 46-shuttle zipper tape looms designed for line-shaft drive were to be used. Before installing the looms they were completely overhauled and individual drives and electric brakes were incorporated in the looms. A change-over from the warp to the beam system of yarn supply is planned for the looms in the near future.

Photoelectric weft detector for looms

Raymond F. Dion & Artemio Laraia (to Crompton & Knowles Loom Works) USP 2,522,101, Sept. 12, 1950.

This invention relates to improvements in weft detecting systems for looms and it is the general object of the invention to provide a simple and inexpensive photoelectric weft detecting

system usable with all colors and shades of weft.

Heretofore it has been proposed to use a photoelectric cell or eye in a weft detecting system for a loom, but it has been necessary to employ expensive and highly sensitive equipment to make the detector capable of distinguishing between the light reflected from a surface on the bobbin and that reflected from weft of almost the same color as the surface. Thus, it has been proposed to provide the weft carrying bobbins with a highly polished metallic ferrule to reflect light from a source of illumination to the photoelectric eye when weft is exhausted. When white weft such as rayon is used there is very little difference between the light reflected by it and that reflected from the metallic ferrule. If a dull black bobbin is used it will be difficult to distinguish between it and a dull black weft.

The present invention provides a photoelectric weft detecting system which will depend for its operation upon two sharply differing degrees of intensities of reflected light when the weft is depleted. It employs two photoelectric cells and relatively inexpensive associated equipment such as relays and power electronic tubes.

It also provides the bobbins with dark and light colored zones both of which will be covered when there is an ample supply of weft, but both of which will be uncovered when weft is depleted. One of the photoelectric cells will be controlled by the white zone and the other by the dark zone. In this way highly reflected white weft and dull black weft can both be satisfactorily detected.

Picker stick hold-down device

(Harold Hoeber) by Barbara O. Hoeber & Wm. T. Read (to Hoosac Mills Corp.) USP 2,548,432, Apr. 10, 1951.

In a loom, a lay having a shuttle box with opposite side walls, a picker stick for driving the shuttle out of the box and a rigid lip of sheet material carried by one of the walls only and extending above the end of the picker stick to limit its upward movement.

Picker stick strap lug

Liday E. Hamilton, Sr. USP 2,548,260, Apr. 10, 1951.

A picker stick strap lug adapted for mounting on a picker stick, comprising an elongated member having a transverse groove adjacent one end thereof, the groove being adapted to receive an element for securing the lug to the stick, a pair of transversely extending wings carried by the member adjacent the groove but inwardly thereof from the end of the member, a second pair of

transversely extending wings carried by the opposite end of the lug, both the pair of wings extending transversely a substantial distance from the sides of the lug, the wings having a width greater than the thickness of the member, and a rib connected between each pair of the wings and projecting from the forward side of the member.

Picker stick check

Harry Frohman. USP 2,550,798, May 1, 1951.

In a picker stick check for looms, the picker stick, being mounted for oscillation in a vertical plane, and the check comprising a plate mounted for oscillating movement in a substantially horizontal plane, and having two a lay, spring loaded means for frictionally securing the plate to the lay of the loom comprising a threaded shaft slidably penetrating the plate, a disk secured to the lower end of the threaded shaft a friction material secured to the bottom of the plate and adapted to be engaged by the upper surface of the disk, a threaded sleeve mounted on the threaded shaft and spaced a substantial distance above the upper surface of the plate, a ball thrust bearing mounted on the exterior of the threaded sleeve, a plurality of compression in the compression springs between the plate and the thrust bearing to thus control the amount of frictional resistance to oscillation existing bewhereby adjustment of the threaded sleeve on the threaded shaft will regulate the compression in the springs between the plate and the thrust bearing to thus control the amount of frictional resistance to oscillation existing between the tween the disk and the frictional material.

Pneumatic thread remover for looms

George N. Peterson (to Crompton & Knowles Loom Works) USP 2,526,269, Oct. 17, 1950.

It is the object of the invention to form a lip of a pneumatic thread remover in such a manner that air may enter directly into the tube without being required to follow a curved path. In this way the lint and dirt moves along with the air into the remover tube and does not collect on the lip or around the mouth. This result may be accomplished by providing the usual form of lip with one or more openings or perforations placed so that air can move in more or less straight lines into the tube without having its velocity and dust carrying capacity reduced.

Shuttle for electronic loom protection

Victor F. Sepavich (to Crompton & Knowles Loom Works) USP 2,551,172, May 1, 1951.

In a shuttle for a loom having a magnet and coil forming part of a signal system, a shuttle body made of non-magnetizable material, a base made of non-magnetizable material extending continuously along and secured to the bottom of the shuttle body, and a mass of magnetizable material between the body and the base.

Shuttle box mechanism for weft replenishing looms

Clarence R. Kronoff (to Crompton & Knowles Loom Works) USP 2,528,150, Oct. 3, 1950.

The invention describes pneumatic shuttle picking means adapted for weft replenishment on looms.

Pneumatic picking mechanisms wherein the shuttle box is tubular and picks a shuttle when compressed air is introduced into it have been proposed heretofore, but so far as is known they have not been adapted for bobbin changing weft replenishment. It is an object of the invention to make a tubular shuttle box of separable parts which are normally closely fitted to each other to act efficiently for pneumatic picking of a shuttle, but movable apart to permit entrance of a reserve bobbin.

The new device also is said to provide: 1) a control of the shuttle box so that it will open for replenishment and close for picking; 2) thread cutting and clamping means; 3) means to effect a second opening of the shuttle box as soon as the thread of the incoming quill is bound into the cloth.

Shuttle tip connection means

Joseph R. Phaneuf & David A. Tebo. USP 2,548,052, Apr. 10, 1951.

Means for connecting a protective end member to a shuttle, the means comprising an outer and an inner sleeve portion in substantially concentric relation and joined adjacent one end thereof by an integral web, the opposed ends of the sleeve portions being provided with oppositely angled bevels, with the bevel on the outer sleeve portion extending in an outward direction and the bevel on the inner sleeve portion extending in an inward direction.

Studies in textile design 8—double plain weaves

Anon. *Textile Recorder 68*, 95-96 (April 1951).

One of the most popular and successful weaves in the woolen and worsted industry is the double plain weave. It uses two plain interlacings which, under certain conditions, produce two separate and distinct cloths, one above the other.

Photographs and design diagrams of four fabrics are given, including a weave using two colors of warp and filling, a shadow stripe costume cloth in which the shadow stripe is produced by means of right and left twist in the warp, a suiting fabric using worsted warp and filling, with mercerized cotton striping threads, and two fabrics using check board designs in reversible patterns.

Thread control for weft replenishing looms

Walter H. Wakefield (to Crompton & Knowles Loom Works) USP 2,551,189, May 1, 1951.

In a weft replenishing loom, a pneumatic thread remover, a selvedge cutter, a thread hook nearer to the selvedge cutter than to the remover, the loom having a thread entering the remover and matted at one end thereof to one end of the second thread as the result of operation of the selvedge cutter, the second thread being engaged with the thread hook, and holding means for the second thread cooperating with the thread hook limiting movement of the end of the second thread toward the remover, the latter pneumatically attracting the threads and the matted ends and cooperating with the thread hook and holding means to effect separation of the matted thread ends before the latter reach the remover.

Weft needle mechanism for axminister looms

Norman Fletcher & Walter Y. Robb (to Crompton & Knowles Loom Works) USP 2,548,662, Apr. 10, 1951.

In weft laying mechanism for a loom having a selvedge shuttle at one side thereof, a flexible sheet metal weft needle, the needle having a concave surface extending lengthwise thereof, actuating mechanism for the needle at the other side of the loom including a toothed rotary member, the needle having longitudinally spaced apertures cooperating with the member to cause movement of the needle toward the selvedge shuttle when the member is rotated in a given direction, and guide means between the member and the selvedge shuttle having a convex periphery engaging the concave surface of the needle and cooperating with the member to direct the needle along a path toward the selvedge shuttle.

Weaving loom

Thomas Hindle. USP 2,551,492, May 1, 1951.

In a weaving loom the combination with the crankshaft of the loom and a motor by which it is driven of a short primary shaft driven by the motor, a flywheel and one member of a friction clutch affixed on the primary shaft, a secondary shaft driving the crankshaft, a reduction gear

between the secondary shaft and the crankshaft, a sleeve rotating with the secondary shaft but slidable thereon, a second member of the friction clutch secured on the sleeve, one member of a friction brake also secured on the sleeve, a stationary member of the brake co-axial with the first member, the member of the clutch and the member of the brake being secured on the sleeve in such positions that when the members of the clutch are engaged the members of the brake are disengaged and vice versa and means capable of both manual and automatic control for moving the sleeve axially on the secondary shaft.

Knitting C 3

Apparatus for forming designs in knitted or woven fabrics of synthetic polyamide fibers

Frank G. Weisbecker (to Perforations, Inc.) USP 2,550,893, May 1, 1951.

Apparatus for forming a design in synthetic polyamide fiber fabric comprising: a fabric supporting plate having a plurality of holes extending normally therethrough; a plurality of fabric piercing members having pointed ends supported for projection through the holes, the fabric piercing portion of the members being circular in transverse section; means for selectively projecting the members through the holes to pierce the fabric supported on the plate at selected points to form a predetermined design; means for rotating each of the members while it is being projected to pierce the fabric; and means to heat and thereby set the fabric while pierced by the members.

Apparatus for knitting striped fabric

Samuel Mishcon & Lester Mishcon (to Supreme Knitting Machine Co.) USP 2,549,701, Apr. 17, 1951.

In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination of a releasable yarn clamp with separable elements for holding the yarns operatively extending from the feeding unit, a pusher member movable between retracted and projected limiting positions, the operative path of the member between the positions intersecting the path of yarn extending from the unit at the knitting position, whereby the pusher member will during its forward movement engage and carry forwardly a yarn in its path, the pusher member being engageable with the clamp between the separable elements thereof, whereby

the yarn carried by the member will be brought into operative engagement with the clamp.

Automatic interlocking machine built by Scott & Williams

Staff. *Textile Industries 115,* 194-5 (Apr. 1951).

This new versatile knitting machine can produce plain interlock, horizontal welt and jaquard stripes, and a variety of tuck stitch formation. The automatic feature of the machine consists of 2 rings mounted in the cap with swivel cams connected to the ring by means of levers and links. The swivel cam thus can be positioned into any one of 4 positions, and changes from one type of work to another can be done in a few minutes. The spiral found in conventional stripes is also eliminated, and there is no break in the stripe. Mfr: Scott & Williams, Inc.

Cotton in tricot knitting

Lyle E. Hessler & Herbert E. Kieke. *Textile Industries 115,* 135, 227, 229, 231, 233 (Apr. 1951).

Cotton yarns have not found the same acceptance for tricot knitting as synthetic yarns, and the purpose of this progress report is to help show the way for cotton in high speed tricot knitting. In experiments in tricot knitting the best possible carded yarn was obtained with care taken in drawing and spinning to give as uniform a yarn as possible. Plied yarns showed more promise than single yarns because of their greater uniformity. Requirements were set up for the treatment of cotton yarn with surface active agents for knitting and include that the material be water-soluble, inexpensive and easily applied, eliminate static, lubricate the yarn, decrease fuzz in yarn, and aid in setting the twist. Some 75 compounds of the anionic and non-ionic types of agents were evaluated with some compounds of each type giving better results than others. Conventional jersey type patterns in single and double bar knit were used for the experiments with no great difficulty encountered in making up garments of these fabrics. Both single and double bar cotton fabrics have good stretch and recovery, and double bar fabrics were found to wash well, hold their original shape, and to be run proof. Studies are now being done of the size of yarn needed for best results on a given pattern and end use, the best twist for smoothness of fabric, rib designs and patterns, etc.

Grouping body knitting machines

Staff. *Textile Industries 115,* 126, 189 (Apr. 1951).

All body type knitting machines are grouped according to the goods being run at E-Z Mills with each machine equipped with individual motor drive. The number of machines in a group assigned to one knitter depends on the size of the yarn run, number of feeds on each machine, and the speed of the machine. This arrangement saves time for the knitters; allows each to become thoroughly acquainted with his machines and thus allows better observation of machine performance; permits close observation of yarn supply and more thorough inspection of knit goods; and also allows adjustments to be made more promptly.

Good housekeeping improves knit-goods quality

E. Dalton White. *Textile World 101,* 114 (May, 1951).

Tile is placed on the front of knitting machines instead of the usual metal pipes and containers, resulting in better cleanliness in knitting room; metal plates are located for similar reasons under the knitting machines, and various other housekeeping ideas are reported from Maryon Hosiery Mill, Carrollton, Ga.

How we train our knitters to straighten needles

H. B. Le Feaux. *Textile World 101,* 122, 123 May, 1951).

Knitters should be responsible for straightening each needle received by the mill regardless of the means used by the needle manufacturer to assure perfect alignment. They should be taught proper methods of straightening the stem and of setting the beard. A full-page illustration outlines the defects caused in fabrics made from needles with bent stems and incorrectly set beards, and drawings show the proper methods of straightening the stem and setting the beard.

Knitters to attend 40th Knitting Arts show

Staff. *Textile Industries 115,* 119-25 (Apr. 1951).

A listing of the exhibitors, their home office addresses and the equipment and/or materials for which they are known, at the Knitting Arts Exhibition to be held April 30-May 4 is presented.

Knitting needle carrier

Richard H. Kenah. USP 2,551,012, May 1, 1951.

A display holder for knitting needles or the like and adapted to support and expose the same

throughout substantially their entire lengths, the holder comprising an elongated flexible body of thin stock having at opposite sides laterally spaced lineally extending stiffening ribs providing needle-receiving grooves there-between and extending throughout the length of the body, the grooves and ribs at one side being offset with respect to the grooves and ribs at the other side whereby to allow space to accommodate needle heads at one end of the body without bringing same into engagement to thereby distort the flexible needles, a body stiffening member secured to the body at one end and coextensive in width with same, the member having portions closing the ends of the needle-receiving grooves whereby to provide stops for adjacent needle ends, and yieldable body-carried needle retaining means disposed transversely of the body at opposite sides thereof whereby to retain the needles in the grooves.

Method for forming designs in knitted or woven fabrics of synthetic polyamide fibers

Frank G. Weisbecker (to Perforations, Inc.) USP 2,550,894, May 1, 1951.

The method of forming a design in a stocking knitted from synthetic polyamide fibers the steps comprising: placing the stocking on a preboarding form; stretching portions of the threads to enlarge the normal distance therebetween at selected points of the stocking by inserting a pointed element through the stocking between the threads at the points; and subjecting the stocking to preboarding treatment.

Rib outerwear machine

Staff. *Textile Industries 115*, 197, 199 (Apr. 1951).

A new automatic 12-feed, 30-inch diameter plain, circular rib knitting machine (Model T.A.-12) is designed to knit outwear fabrics at a high rate. The machine has a cylinder and a dial, and the cylinder needle has a clip on the side which, when in transfer position, spreads the cylinder loop and brings it in line with the dial needle. All feeds are independently controlled and 4-color stripers at each feed are available. Other features include improved short chain system for garment length control, automatic stitch adjustment, two-speed drive, etc. Mfr: Jacquard Knitting Machine Co.

Seamless hosiery machines

K. O. Metz. *Textile Industries 115*, 127-33 (Apr. 1951).

Brief descriptions of the various types of circular hosiery knitting machines used by the American Industry are presented with information given on the type of goods each is capable of manufacturing.

This mill doesn't stretch its tubular-knit fabrics

E. Dalton White. *Textile World 101*, 128, 129 (May, 1951).

Gurney Mfg. Co. uses a tensionless combination processor and dryer after wet finishing. Steam drying is done in the final finish. The combination processor and dryer is called the Tube-Tex process. Relaxed and high-quality fabrics are said to be produced.

Woven fabric effects

Anon. *Textile Mercury and Argus 124*, 506 (March 23, 1951).

Machine details varied fabric production of spring needle. Machines are described. Patterns include: herring-bone pattern; a fabric in three colors; horizontal striping; long loop astrachan, and terry effect.

Yarn serving clamping mechanism for knitting machines

Eugene F. Miller (to Hanes Hosiery Mills Co.) USP 2,551,385, May 1, 1951.

Yarn clamp mechanism for a circular knitting machine having a rotary needle cylinder, means for actuating the needles, groups of individually retractable interchangeable yarn feeds positioned at spaced intervals circumferentially of the cylinder, the mechanism including fixed supporting plate in concentric relation to the cylinder, clamps mounted on the plate at different levels, one adjacent each group of yarn feeds for holding the respective yarn ends when the feeds are withdrawn, and guard means also on the plate associated with the respective clamps in the direction of cylinder otation, operative, upon successive insertion or withdrawal of individual feeds of the different groups to keep the yarns definitely separated while directing them from or to the respective clamps at the different levels.

Special fabrics C 4

Laminated fabrics

A Felix. Brit. P. 647,139. *J. of Soc. of Dyers and Cols. 67*, 128 (Mar. 1951).

Layers of fabric are bonded together under heat and pressure using as the adhesive a cellulose acetate-solvent-plasticiser mixture. The products are permeable to some extent, and bleeding of dyed material is controlled or eliminated,

so that wool or rayon fabrics may be treated.

Porous fibrous products

A. Talalay. Brit. P. 646,422. *J. of Soc. Dyers and Cols. 67*, 128 (Mar. 1951).

A porous sponge-like mass suitable for cushioning material, heat-insulation, etc., is obtained by spraying an aqueous dispersion of an elastomer, e.g., rubber latex, on single or multiple layers of a carded fiber web and then drying. Wool or other fiber having the same dimensional and kink characteristics is employed, and the final product contains a ratio of elastomer to fiber 1:1.

STANDARD FINISHING D

An introduction to textile Finishing

By J. T. Marsh. John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 552 pages. March 8, 1951. Price $5.50.

A book designed to fill the need created by the many recent developments in chemical aspcts of finishing, "An Introduction to Textile Finishing" is not restricted to wool, cotton, or any other single fiber. It covers the entire field of varied fibers. The author uses two criteria in choosing the finishes to be covered by the book: commercial importance and scientific and technical interest.

The book is said to be the first book to treat all the new finishing developments in a systematic way. Though the emphasis is on recent discoveries in the field, there is also a revaluation of the older commercial processes in the light of the more recent discoveries.

Analytical survey of the problem of scouring

R. L. Elliott. *Textile Recorder 68*, 102-104 (April, 1951).

Wool scouring is complicated by the presence of a great variety of materials that must be removed from raw wool, yarn, or fabric, and by the structure of the fiber itself. The materials removed are classified by their various properties, and mention of their origins is given, along with a history of the development of soap and other scouring methods. The presence of natural wool grease and mineral particles are explained. The character of soaps, processing oils, and synthetic detergents are briefly described. Two tables classify anionic synthetic detergents and non-ionic detergents.

Caustic concentrating system

Staff. *Textile Industries 115*, 137, 139 (Apr. 1951).

Operation and maintenance costs during the past six years of Zaremba caustic concentrating equipment used in conjunction with a Babcock & Wilcox Co. boiler at Spinners Processing Co. have been remarkably low. The equipment consists of a triple effect evaporator, a surface condenser with steam jet air ejector, a heater, a concentrate cooler, and pumps. An average of 6,500 gallons of caustic soda washwater from mercerizing machines is handled every 6 hours, and approximately 90-92% of the caustic soda is recovered. Only one operator, giving only part of his time, is required for the system; and maintenance of the equipment involves only cleaning of the inside of the liquor tubes and the storage tanks about once a month.

Mechanics of wool felting

R. W. Moncrieff. *Textile Manfacturer 77*, 157-161 (April, 1951).

To correlate measurements of wool scaliness with milling shrinkage, tests showed:

1) Increased flexibility of wet fibers while under water, showing that scaliness under water was much greater than in the air, a fact attributable to closer embedding with other fibers, which probably explains why dry wool will not felt.

2) Increased scale projection—the scales stood out farther from the swollen wet fibers than from the dry fibers.

But factors other than scaliness should be considered, and a perfect correlation between scaliness and felting potential did not exist. Some of wet-scaliness measurements (for instance on wools such as Southdown) led the author to expect it to felt the most, while in fact it felts the least of all those measured.

The other factors considered by the study: length of fiber, crimp, persistence of scaliness, elastic properties, swelling, etc.

New automatic conductivity controller

Anon. *Textile Mfr. 77*, 187 (April, 1951).

See front section.

Rate of surface tension lowering and its role in foaming

Emil J. Burcik. *J. of Colloid Science 5*, 421-36 (Oct. 1950).

A systematic study of the rate of surface tension lowering and its relation to foam stability. Pure sodium laurate, sodium dodecyl sulfate and sodium oleate were the surface-active agents used in this research. The conditions shown to favor high foam stability are (1) low surface

tension relative to that of the pure solvent, (2) moderate rate of surface tension lowering and (3) a high bulk or surface viscosity.

The drying of textiles

Anon. *Textile Recorder 68,* 114-16 (Apr. 1951).

The following abstracts are printed of several papers at a symposium organized by the Northwestern Section of the Institute of Fuel held at Manchester, England: "Problems in the Drying of Textile Packages"; "Steam Consumption in Textile Drying"; "The Acceleration of Cylinder Drying"; "The Efficiency of Stenter Drying"; "The Drying of Packaged Wool"; "Effect of Drying on Textile Dyestuffs"; "The Drying of Viscose Rayon Cakes"; and "Continuous Drying of Rayon Staple".

Use of ultra-sonic vibrations in textile treatment

A. J. Hall, *Textile Mercury and Argus 124,* 493 (March 23, 1951).

An ultra-sonic process (B.P. 618,794) is concerned with modifying wool so that it has a reduced tendency to felt and thus to shrink when washed. It appears to be exceedingly simple although of course it may not be economical. The process consists of generating ultra-sonic vibrations within a liquid, such as water, in which the wool material is immersed. This, in one example, all wool knitted fabric immersed in water is there exposed for one-half hour to ultrasonic vibrations (250 kilo-cycles per second) produced by a piezo-electro oscillator having an input of 600 watts of electrical energy. Under these conditions the wool is so changed that when withdrawn and milled together with untreated similar fabric it shrinks only 5 per cent. in area during milling whereas it formerly shrunk 32 per cent.

It is perhaps somewhat premature to decide exactly what happens to wool to produce this useful resistance to shrinkage. It is claimed that in appearance and handle and in its resistance to abrasion the wool seems to be completely satisfactory and to appear identical with untreated wool. Assuming that felting is due to the uni-directional roughness which characterizes wool fibres and which is most probably due to the covering of each fibre with tough epithelial scales it is possible that the overlapping edges are less able to cause roughness. But this is a subject which requires further investigation.

According to B. P. 648,830 viscose rayon manufacture uses ultra-sonic vibrations. It is

possible to modify the way in which the regenerated cellulose filaments are formed by exposing them to ultra-sonic vibrations whilst travelling from the spinneret to the first Godet wheel or even following their course of travel from the Godet wheels. This use of ultra-sonic vibrations arises from the observation that they can accelerate the penetration of the coagulation liquor into the interior of each viscose rayon filament whilst it is passing through the coagution bath or whilst it is in contact with adhering coagulation liquor whilst leaving the last Godet wheel. But it is possible that this is not the only effect of the vibratons on the course of formation of the viscose rayon filaments.

Yarn steamer

Rae Harris. USP 2,525797, Oct. 17, 1950.

The invention describes a yarn racking device, and a yarn reconditioner.

The primary object is the provision of a device wherein used yarn can be reeled in a manner that it can be conveniently reconditioned for removing kinks and wrinkles, so that it may be reused and having the appearance as new yarn in knitting.

Another object is the provision of a device in the form of a rack having a reel appearance, with a handle extension for carrying a conical wooden plug, which is insertable in the pouring spout of a water kettle or the like during unreeling of the yarn, so that when the yarn is upon the rack it can be subjected to steam or hot vapors from the contents of the kettle, whereby the yarn will be reconditioned, and such reconditioned yarn can be readily and easily unwound from the reel with dispatch while attached to the kettle.

DYEING AND PRINTING E

A rapid dyeing process for acetate

Brit. P. 648,725; *Skinner's Silk & Rayon Rec. 25,* 532 (Apr. 1951).

To achieve rapid dyeing, acetate rayon fabric is impregnated with a dye liquor which contains an aliphatic organic swelling agent for the rayon fibers. In this process acetic acid is used, and an inorganic swelling agent such as sodium ammonium or potassium thiocyanate. Normally there should be about 25% to 35% of acetic acid and 3% to 10% of sodium thiocyanate in the dye liquor. Such a dye liquor should be used at 20°C. to 60°C. The dye absorption takes place within 15 seconds and fabric can be run through the padding mangle up to 60 yds. per

min. After such treatment it is merely necessary to wash off the fabric and dry.

Apparatus for dyeing or otherwise treating fibrous materials

John M. Rugh, (to Mary Rugh & Flora M. Rugh) USP 2,548,740, Apr. 10, 1951.

An apparatus for dyeing or otherwise treating fibrous materials comprising a vessel for containing the materials and the treating liquid, the vessel having a perforated partition spaced from the bottom thereof providing a compartment spaced from the lower portion of the vessel for containing the material to be treated and a sump below the partition, a closure for the vessel, an outlet at the upper portion of the vessel, an expansion chamber, a first conduit from the lower portion of the expansion chamber to the lower portion of the vessel, a second conduit from the outlet to the top of the expansion chamber, means for controlling flow of liquid through the second conduit, a vertical conduit in the vessel extending from the sump through the partition to above the level of the material in the compartment and having an opening in the lower portion thereof exposed to the liquid in the sump, means including a rotatable impeller positioned in the last opening for moving the liquid from the sump upwardly through the conduit in a volume greater than may flow through the controlled conduit, whereby to build a pressure in the vessel above the level of the material to force the liquid downwardly through the material, and through the perforated partition to the sump thus by passing the circulation through the expansion chamber.

Dyeing Vinyon N.

R. B. Baker (to American Viscose Corp.) USP 2,548,853 Apr. 17, 1951.

Vinyon N textiles are dyed after a pre-treatment in 75 to 85% aqueous sulfuric acid solution for 15 seconds to 5 minutes at room temperature, washing and drying, a cellulose acetate type of dyestuff being used.

Dyeing acetate rayon

Brit. P. 647,897; *Skinner's Silk and Rayon Rec. 25,* 532 (Apr. 1951).

A process wherein pyridine is used instead of caustic soda. By this method vat dye liquors can be prepared which are suitable for applying vat dyes to acetate rayon without adverse effects. Preferably another organic or inorganic swelling agent is added to increase the action of the pyridine. A satisfactory liquor can be made by

using sodium hydrosulfite, pyridine, and di-acetone alcohol with sodium thiocyanate.

Contemporary vat dyeing practices

Ormond W. Clark. *Textile Industries 115,* 186 (Apr. 1951).

Highlights and extracts of an address before the Southeastern section of the AATCC are given and include notes on pick-up, padder rolls, drying pigment padded cloth, and aids in pad steam open width processing.

Filament rayon now dyed in packages

W. A. Thomason, Jr., *Textile World 101,* 120, 121, 298 (May, 1951).

Central Yarn and Dyeing Co., Gastonia, N. C., has developed a method to package dye fine-denier (15 and 20) nylon for the hosiery trade. The system is believed to be the first application of the technique. Gaston County Machine Company kiers are used. Important factors stressed by the article are: soft dye packages must be wound with uniform pressure throughout; cup separators are used on spindle carriers to hold package ends in place; in dyeing rayon, dyes of maximum affinity must be selected without addition of salt; salt is added slowly after 20 to 30 minutes of dyeing.

Migration in relation to moisture content

J. M. Preston & A. Bennett. *J. of Soc. of Dyers & Cols. 67,* 101-3 (Mar. 1951).

Migration which occurs during drying has been studied for different textile materials and different moisture contents. The greater the moisture content the more marked is the migration, and there is a characteristic lower limit at which it ceases.

New boiler house at dyeworks

Anon. *Textile Manufacturer 77,* 173-174 April, 1951).

New boilers at William Hall & Co. are fitted with modern coal elevators, automatic stokers and tube cleaning equipment, induced draft, and a highly efficient grit arrestor.

New and versatile dyeing and finishing plant

W. A. Thomason, Jr. *Textile World 101,* 124-126 (May, 1951).

Description of Delta Finishing Co., a division of J. P. Stevens Co., with details and photographs of the new plant at Wallace, S. C. Mercerizing, open-width or rope dyeing, Sanforized shrinking, and various other types of finishing are done.

Non-injurious copper in textiles to be rubberized

S. Lee, M. W. Weiss & E. Hoffmann. *India Rubber World 124,* 58-61 (Apr. 1951).

It is generally recognized that although "free" or "ionic" copper even in minute amounts may be extremely injurious to rubber, the combined copper in certain textile colorants is essentially harmless. Present methods of testing involve the complete destruction of the sample and the conversion of harmless combined copper into the free form in order to permit detection and estima tion. Such procedures, therefore, do not allow differentiation between free and combined copper, and, thus, according to present specifications, classify as unsuitable for rubber coating any fabrics colored, for example, with phthalocyanine pigments. A method is proposed for detecting only the injurious copper in textile products, with ample sensitivity to meet present requirements.

Piece goods dyeing by hot oil process

Staff. *Textile Industries 115,* 145 (Apr. 1951).

A new method of dyeing vat, sulfur, and other dyes, using the Williams unit, is said to be more economical in handling short runs, give better shading, give better appearance of dyed material, give greater stability of dyes, and decrease the time of development. Vat dyes are applied by padding, drying the material, passing the cloth through one Williams unit containing caustic soda and hydrosulfite and then into a Williams unit containing a hot white mineral oil. Igepal CA is then used to remove the oil absorbed by the cloth. Sulfur dyes are applied from a reduced bath in a 2 or 3-roll pad; the fabric is then passed directly into a Williams unit containing hot white mineral oil; and the oil is then removed by passage through Igepal CA.

Two-bath method

W. T. Sledge. *Textile Industries 115,* 125, 189 (Apr. 1951).

A two-bath method of dyeing full-fashioned and seamless nylon hosiery, used at one mill, includes a scour bath at 190°F for 25 minutes with 4% synthetic detergent, ¼% sodium hexametaphosphate, 3% oxalic acid. The dyebath includes 2% synthetic detergent and ¼% sodium hexamethophosphate well pasted with the dyestuff, and for 15 denier hosiery is started at 100 F, run for 20 minutes, then brought within 10 minutes to 150 F and run 35 minutes. For 30 denier hosiery the bath is started at 120 F within 10 minutes and run 35 minutes. After the material is dyed or bleached it is given 2 rinses at 120 F and then resin finished for 20-30 minutes.

In bleaching nylon hosiery, the scour bath used in dyeing is prolonged to one hour. The hosiery is then given 2 rinses at 140 F and is bleached 40-50 minutes at 190 F with 10 pounds of silicate of soda, 8 pounds of hydrogen peroxide, 130 volume per 240 gallons of water, and a few grains of acetate violet. Reproductions from using this method have been found to be more positive.

SPECIAL FINISHING F

Fire-proofing textile fabrics

Ladislaus Balassa & Neil C. Spencer (to U. S. Finishing Co.) USP 2,550,134, Apr. 24, 1951.

A textile fabric rendered fire-resistant by impregnation with a composition comprising borax, boric acid, glycerol, and triethanolamine.

Moisture-resistant flameproofed product and method of making same

Oscar Edelstein (to The Pond Lily Co.) USP 2,526,462, Oct. 17, 1950.

See front section.

Treatment of cellulosic materials to impart flame resistance

Anne MacMillan, Roy H. Kienle, & Theodore F. Cooke (to American Cyanamid Co.) USP 2,519,388, Aug. 22, 1950.

See front section.

Waterproofing fabric

Brit. P. 650,131. *Fibres 12,* 137 (Apr. 1951).

A relatively simple method of producing water repellency based on passing the textile material through a chamber filled with the vapor of monomethyldiethoxysilane. The conditions of the treatment are controlled so that enough of the monomethyldiethoxy-silane is picked up by the textile material to react with its natural moisture content to form a siloxane. This siloxane is preferably stabilized by heating the textile material up to 150° for about 5 minutes.

TESTING AND MEASUREMENT G

Clothing and fabrics G 1

Simplified statistics for small numbers of observations

R. B. Dean & W. J. Dixon. *Analytical Chemistry 23,* 636-8 (Apr. 1951).

Several short-cut statistical methods can be used with considerable saving of time and labor. This paper presents some useful techniques applicable to a small number of observations. Advantages of the median as a substitute for the average are discussed. The median is especially useful when a quick decision must be made and gross errors are suspected. The range may be used to estimate the standard deviation and confidence intervals with little loss in precision for small numbers of observations. A convenient criterion for rejecting gross errors is presented. A table gives deficiencies and conversion factors for two to ten observations.

Statistical quality control in the textile industry

B. G. Wiggers. *Enka Breda Rayon Revue 5,* 13-28 (Feb. 1951) ; *in Dutch.*

After a short characterization of the task and place of the mathematical statistics in general, the industrial statistics and the statistical quality control (control charts, sampling tables) are considered more in detail. The statistical methodology is elucidated on the basis of the fundamental problem of the irregularity of yarns, sliver, etc. It is in particular discussed how the control charts can be used for the efficient treatment of data of the routine control, so that complicated and meaningless tables become superfluous. The technique of the so-called X and R-control chart is extensively described.

Instruments and instrumentation G 2

Automatic froth measuring apparatus

Ernst Gotte. *Melliand Textilber. 31,* 210-12 Mar. 1951) ; *in German.*

A new fully automatic apparatus for measuring froth for testing the frothing quality of substances that lower surface tension. Pure sodium alkyl sulphates were tested with its aid; their resistance to frothing reaches its maximum at the critical concentration of the formation of micellae, while the volume of the froth increase linearly with the logarithm of the concentration.

Continental textile machinery advances

Anon. *Textile Weekly 47,* 912, (April 6, 1951).

A new type of automatic yarn strength tester manufactured by Zellweger, Ltd., Uster, Switzerland, is being shown at the Basle Fair and limits the amount of work required in testing a given yarn to putting the apparatus in operation and reading off the measured result. A test piece 20 in. long and prepared according to D. I. N.

and S. V. M. T. standards is submitted by the machine to a load increasing exactly in proportion to the time until the breaking point is reached. It is possible to measure yarns of cotton, wool, staple fibre and rayon with tensile strengths up to 2kg. and elongations at breaking point of up to 40%.

The time to the breaking point can be adjusted and, with a time of about 20 seconds, 120 tests can be made in an hour. For each tensile test, the modulus of breaking point and the elongation at breaking point are plotted automatically on diagram paper with absolutely lineal graduation in the order of occurrence. The apparatus stops automatically on completion of the desired number of tests to which it has been set. Up to 1,000 tests can be measured on one working operation.

From the continuous record of the breaking point values automatically made by the machine, any periodic disturbances can be recognized and conclusions as to their origin may be drawn from the lengths of the periods. In conjunction with the current indication of the number of tests already completed, the average value of the breaking force and the elongation at the breaking point can be determined at any moment from the sums of these two values. The frequency curve gives a very clear picture of the distribution of the tensile strengths. In the frequency curve, of which any desired number of copies can be made with a very small expenditure of time, the minimum strengths can be read at once, and also the quadratic dispersion and/or the lineal unevenness may be simply calculated. An evaluation based on the assumption of a Gauss distribution gives the quadratic dispersion with sufficient practical accuracy and a minimum expenditure of time.

Three examples of their type 100W and 200W type looms are being exhibited by Messrs Adolphe Saurer, S. A., Arbon, at Basle. These are all automatic pirn-changing looms. The 100W type being shown with either single shuttle and 110cm. reed space or four shuttles for colour work and 170cm. reed space, the latter being equipped with the Saurer "positive movement" dobby system. The type 200W loom being exhibited has a reed space of 120cm.

Electronic device speeds instrument reading and data handling

Staff. *Textile Industries 115,* 91 (May, 1951).

See front section.

TEXTILE MILLS H

A pipeline that moves—the zipper belt conveyor

Anon. *Modern Materials Handling 6,* 45-8 (May, 1951).

See front section.

Aim your sights at upkeep in the power plant

F. L. Bradley. *Textile World 101,* 141, 143, 211 (May, 1951).

Forstmann Woolen Company emphasizes power-plant upkeep rather than repair. Proper design of power plant equipment, improved stokers, the use of special screens to prevent zeolite blow holes and of stainless steel in coal-feeder systems, and other features of Forstmann practice are described.

Break the bank

Staff. *Textile Industries 115,* 93 (May, 1951).

See front section.

Controlled humidification in woolen and worsted mills

H. V. Tetlow. *Textile Manufacturer 77,* 175-178 (April, 1951).

Complete details are given of a humidifying system designed and built to condition an area of 168,800 cu. ft., in which were located 8 sets of scribbling and carding and 10 storage bins, each capable of holding 5,000 pounds of wool.

Electrical Installation testing

Anon. *Textile Manufacturer 77,* 164-166 (April, 1951).

A practical survey of methods of testing electrical equipment, including insulation resistance, effect of temperature and moisture, testing insulation, testing precautions, and the location of weaknesses.

Fine, dry materials? Pour them like water

Anon. *Modern Materials Handling 6,* 61-3 (May, 1951).

See front section.

Here's a testing program

Dame S. Hamby. *Textile World 101,* 99-105 (May, 1951).

A suggested program for mill quality control tells how often to test incoming fiber from the bale, how often to test blends, what to use to test laps, when nep counts should be made, how many cards should be sampled, the importance of tests at the drawing frame, the lesser importance of roving frame testing, that daily yarn strength tests are needed, that twist tests for ply yarns should be daily, that twist tests for singles are needed less often, the importance

of using the stroboscope, when to grade yarns, the great importance of moisture testing, and to test the product of every machine that has been worked on.

Sample size for fiber tests varies from 10% to 100% of the shipment. The 10% testing usually includes staple length, strength, and fineness. Fineness is a factor in the formation of neps. One mill tests two samples from each bale on the Micronaire, finding that they can control neps by rejecting all cotton that falls below a rating of 3.0.

Another feature of the article is a method of calculating sample size based on the ASTM "Standards on Textile Materials", and Sections 13 and 14, Supplement B, ASTM Manual on Presentation of Data.

It's a conveyor that acts like a hose

Anon. *Modern Materials Handling 6,* 38-9 (May, 1951).

See front section.

Single fork-truck cuts handling costs

Anon. *Textile World 101,* 113-115 (May, 1951).

Handling costs were reduced 65% at Crystal Springs Bleachery, Chickamauga, Ga., by the use of one lift truck with clamp attachment; while Green River cut bale-handling costs 50% with one 1,000-lb. fork-lift truck that permitted closer stacking of bales and increased available floor space and storage by 10%.

The first mill uses a conveyor to bring rolls of unbleached cloth to temporary storage, where the fork truck removes it to another area for tagging operations. After tagging, the bales are moved by the fork truck to storage. Formerly four or five men were needed to move and store 200,000 pounds.

Green River Mills stacks and handles 200 bales of cotton in an 8-hr. period, and the same truck is used to load highway trucks with cartons of yarn and to load waste bales for shipment.

Silver lap conveyor

Staff. *Textile Industries 115,* 165 (Apr. 1951).

Sliver laps are transferred from the lapper machines to the combers and the empty cones are returned on a loop of monorail track at one southern mill. Three-tier rack monorail carriers are loaded at the lappers while carriers are on the loading tracks inside the large end of the loop. The carriers are then pushed through the track switch onto the outside loop, and a MonoTractor

which is stopped automatically ahead of the switch pushes the carriers to the combers. The system has eliminated £4 man hours in 3-shift operation and has brought slightly more than 84% return on the cost of the installaiton.

Zonor system speeds distribution

Anon. *Modern Materials Handling 6,* 31-3 (May, 1951).

See front section.

CHEMISTRY AND PHYSICS OF MATERIALS I

Acrylonitrile copolymer

Costas H. Basdekis (to Monsanto Chemical Co.) USP 2,548,282, Apr. 19, 1951.

Acrylonitrile is copolymerized with other monomers by adding a predetermined mixture of the monomers gradually to water at the reflux temperature in the presence of an alkali metal soap of mahogany acids and from ½ to 2% of on the cost of the installation.

Auto-hydrolysis of acid oxycelluloses

G. F. Davidson & H. A. Standing. *J. of Textile Inst. Trans. 42,* T141-44 (Mar. 1951).

Investigations of acidic properties of cotton cellulose and oxycelluloses to be inherently unstable when their carboxyl groups are in the free-acid form.

Accessibility of cellulose by formic acid esterification

R. F. Nickerson. *Textile Res. J. 21,* 195-202 (Apr. 1951).

A method of investigating the structure of unsubstituted celluloses by formic acid esterification is presented. It is proposed that the degree of accessibility of a cellulose structure to water is a far more useful value than the degree of crystallinity. Cellulose structure appears to contain three distinct parts: one part is immediately accessible to a contracting medium like water; a second part is potentially accessible; while a third is inaccessible. Accessibilities must be described in terms of the swelling power of the contacting medium, which may convert varying amounts of the potentially accessible cellulose.

Anti-static treatment for nylon

Brit. P. 649,877; *Fibres 12,* 123 (Apr. 1951).

Static is prevented by the application of an aqueous solution of a hydroscopic polyhydroxyaliphatic liquid, such as glycerol or diethylene

glycol, which also contains a small amount of NaCl.

Copolymer of acrylonitrile and isobutene and method for its production

Marion R. Lytton (to American Viscose Corp.) USP 2,549,913, Apr. 24, 1951.

Method for the production of a copolymer of acrylonitrile and isobutene containing, in the copolymer molecule, from 89.5 to 90.5 mol. per cent of acrylonitrile and from 9.5 to 10.5 mol percent isobutene, which comprises copolymerizing 12 parts of weight of acrylonitrile and 37 parts by weight of isobutene, under pressure, with stirring, in an aqueous medium containing an emulsifying agent consisting of sodium oleate and potassium persulfate as polymerization catalyst, the copolymerizing time being 60 hours and the temperature of copolymerization being 50°C.

Fluorinated acrylonitriles

David W. Chaney (to American Viscose Corp.) USP 2,549,892, Apr. 24, 1951.

A fluorinated propionyl chloride or fluoride which may be used for the production of fluorinated acrylonitriles.

Hydrolysis of cellulose

Geoffrey Beall & Lef Jorgensen. *Textile Res. J. 21,* 203-14 (Apr. 1951).

There is developed a new treatment of the problem of the degradation of cellulose. This treatment restricts the study of the frequency distribution of cellulose of various degrees of polymerization to the calculation of statistical moments. In general, the agreement between theoretical and actual results was good. This result substantiated the theory that the disjunction of the cellulose molecule, with hydrolytic cleavage, occurs randomly throughout the length of the molecule.

New developments in electronic instruments

Anon. *Textile Recorder 68,* 118 (April, 1951).

An industrial pH transmitter has been designed for automatic control of pH values in chemical manufacturing processes. It is made by Electronics Instruments Ltd., of Paradis Road, Richmond, Surrey, England.

Another instrument is the new Mullard Ultrasonic generator made by Mullard Electronic Products Ltd., Aboyne Works, Aboyne Road, London. It operates with a quartz crystal. The methods available for generating ultrasonics depend upon the medium which is to be irradiated

but, for the treatment of liquid and solids, only two methods are commonly employed. Broadly speaking, they serve for the generation of low frequency and high frequency ultrasonics.

Oxidation of cotton cellulose

T. P. Nevell. *J. of Textile Inst. 42*, T-130-40 (Mar. 1951).

The x-ray powder diagrams of a series of nitrogen dioxide oxycelluloses have been compared with the diagram of unmodified cotton. It has been found that a high proportion of the primary alcohol groups of cellulose may be oxidized both in the presence and absence of water without the crystalline structure of the cellulose being destroyed. Very highly oxidized materials gave diffuse x-ray diagrams. These results have led to the conclusion that nitrogen dioxide is probably the oxidizing species in the gaseous equilibrium mixtures of nitrogen dioxide and dinitrogen tetraoxide employed for oxidation. The salt of the oxycelluloses with certain other basic dyes gave diagrams indistinguishable from those of the original oxycelluloses. These results have been discussed in the light of Speakman and Elliott's theory of the dyeing of the crystalline phase in wool with acid dyes.

Oxidation of cotton cellulose

T. P. Nevell. *J. of Textile Inst. Trans. 42*, T-91-129 (Mar. 1951).

Extended experimental studies of some of the important properties of the nitrogen dioxide oxycelluloses. These properties include the extreme instability of the oxycelluloses towards dilute or weak alkalis, the insolubility of their nitrates in acetone, their sensitiveness towards non-alkaline electrolyte solutions, their strong affinity for methyl alcohol, and their behavior towards water vapor. Useful information concerning side reactions has also been obtained from measurements of the gain in weight suffered by cellulose during oxidation by nitrogen dioxide and the increase in carboxyl content of the oxycelluloses when they are treated with chlorous acid.

Production of films and filaments

John C. Sauer (to E. I. duPont de Nemours & Co.) USP 2,549,935, Apr. 24, 1951.

Films and filaments may be produced from polymers of hexafluoropropene.

Radioactive tracer techniques

Anon. *Textile Mercury & Argus 124*, 544 (March 30, 1951).

Definition of radioactive atoms as radionuclides, a description of their various types of radiation, as well as notes on their detection and measurement highlighted this report of a paper by Dr. A. Robson of the British Wool Industries Research Association on "Radioactive tracer techniques and their possible applications to industry." (Paper was read before the Society of Dyers and Colourists, West Riding Section).

Removal of static in textile processing

G. Neuhof. *Textil-Praxis 5*, 224-28 (Apr. 1951); *in German.*

The factors leading to the generation of electrical charges of textile materials during processing are explained, and a short list of the more commonly used fibers is arranged in order of transition from positive to negative charge generation; that is, when any two of the materials are rubbed together, the one placed higher in the list will develop a positive charge while the other becomes negative. Various devices for removing these charges are described in some detail.

Solvent for polyacrylonitrile polymers

Brit. P. 649,474; *Skinner's Silk & Rayon Record 25,,* 536 (Apr. 1951).

Alpha-chloro-beta-hydroxy propionitrile is a satisfactory solvent for polyacrylonitrile. With the use of this solvent, gelling of the polyacrylonitrile solutions does not take place above 50°C. and the solutions can be made at about 100°C.

Treatment of cellulose

Jos. Seiberlish (to Research Corp.) USP 2,549,713, Apr. 17, 1951.

The method of increasing the absorptivity of cellulose for and its reactivity with sodium hydroxide which comprises immersing cellulose in a liquid consisting essentially of a halogenated hydrocarbon having not more than three carbon atoms, and thereafter immersing the cellulose in a solution of sodium hydroxide.

BINDERS FOR DIGEST

A few more binders are available for DIGEST readers. Three-ring style to fit the DIGEST, $3.00, postage prepaid U. S. A.

7

Ring Uses No Traveler—J-3 Draft Distribution Determined By Research—Loom Attachment Weaves Waterproof Cotton Fabrics

NEW RING USES NO TRAVELER

A new invention eliminates travelers on spinning frames and twisters according to USP 2,550,761 by Ralph V. Blackwood, Lumberton, N. C.

The device is an improved yarn guide ring which can be mounted on conventional ring rails.

Actually, the guide ring is a floating ring. Yarn from the front rolls passes around the ring and then to the bobbin.

The floating ring performs the same function as a traveler but does not require a lubricant. Wet or dry twist yarn is said to be free of the lubricants or stains normally found on yarn from conventional twisters.

The new guide ring or floating ring rests on a groove which is formed by two ring-like supports. These supports are fastened to the ring rail and greatly resemble conventional rings.

THREE PRODUCTION LEAKS DISCLOSED

Today, with every pound of spinning-room production urgently needed to supply the demand for yarns, it is necessary to seek out the causes for "ends down", to reduce this source of lost production, and to take every possible step to build up the production of the spinning rom.

In the course of recent experience, case reports made by Saco-Lowell engineers pointed out some common sources of lost production.

Case I

A mill on print cloths spun 31s warp and 40.5s filling, but had trouble with excessive ends down which was traced to weak places in the roving.

However, a careful analysis of the roving showed that it was very even; in fact, the 2.00 hank warp roving averaged about 27 percent variation of the Uster tester, and over a thousand short-length weightings failed to disclose any serious unevenness in the roving.

The setting of the roving frames and drafting rolls was checked, the tension was carefully observed doff-by-doff, the gearing was checked for loose gears or broken teeth, but nothing of a harmful nature was discovered.

A study of the mill records brought out that the only basic change in the spinning-room equipment was the installation of a system of traveling overhead cleaners.

A further study showed that since this installation had been in use, there was an increase of almost 59 percent in the amount of roving waste, and an increase of almost 30 percent in the ends down.

An examination of the overhead cleaners brought out the conclusion that the strong air blast was either blowing the roving in two, or so reducing its strength that it parted as it was drawn into the nip of the back rolls.

The air volume could not be reduced and the settings of the air discharge chutes could not be changed, without reducing the cleaning to a harmful extent.

The answer to the problem: raising the roving twist multiple from 1.20 to 1.35, locking the fibers together more securely.

It was apparent that mills operating long draft spinning frames with overhead cleaners can now make their roving with twist above that which has not in the past been considered as good practice.

Case II

A mill manufacturing 20's warp and 23's filling found that their ends down were about 30 percent higher than those in a neighboring mill. Both mills had the same grade and type of cotton. both ran the same spindle speed, and had the same size ring and bobbin.

However, the mill with the higher number of ends down seemed to pay little attention to two very important matters: a) the traveler cleaners, and b) the cleanliness of the spindles.

A survey of the frames showed that over 60 cent of the traveler cleaners were either missing or ineffective, and that practically every spindle had a choke of compressed oily dust and waste at the base, which was acting as an effective spindle brake. Stroboscopic tests showed variations in spindle speeds as great as 650 rpm. below the standard of 9650.

To correct these defects, a cleaning program was started by putting on a small crew to clean the accumulations from the bases, to cut off and replace the badly stretched or damaged tapes, and to report any evidence of crooked spindles or worn bolsters.

Another small crew replaced the missing traveler cleaners, and reset the remainder to a gauge which provided two adjustments—one to establish the distance from the flange of the

ring to the other side of the traveler cleaner, the other to establish the angle which the pin made with the surface of the ring rail.

In this particular case, the pins were bent in toward the ring and then forward in the direction of rotation.

The reasons for these bends are quite logical. By bending the pin towards the ring flange, the distance of clearance between the point and the outside edge of the travelers can be regulated in a manner to get effective traveler cleaning. By inclining the pin in the direction of rotation, the air current developed by the "balloon" will blow off any lint which is transferred from the traveler to the cleaning pin.

Case III

In this mill, there was also a study of the ends down which brought out the interesting fact that on certain spindles of certain frames, there was recurrent trouble from undrafted roving. Instead of being caused by the usual "hard ends" in roving, the trouble was in the traverse motion of the spinning frame.

First, the roving trumpets were not correctly adjusted on the supporting rods, and secondly, the traverse of the roving guides was too long for the length of the top roll bosses. The traverse motions and roving guides on all the spinning were quickly and accurately checked and adjusted, with excellent results. (Condensed from *Saco-Lowell Bulletin*, March 1951).

GRADUATE STUDY ON J-3 DRAFT DISTRIBUTION REVEALS NEW FACTS

In a series of forty-two test distributions of draft on the J-3 roving frame, it was determined that, all other factors equal, a weight of 11½ grains per yard of stock in the forming or condenser zone produces the most uniform roving.

It was also found that a sliver with a weight of 62 grains per yard, plus or minus 5 or 6 grains, produced a roving more uniform than that produced from either a heavier or lighter sliver.

Furthermore, it was concluded from the tests that coarse rovings can be produced with better uniformity than fine rovings.

As a further gain from research, a handy chart system of determining the front draft gear was devised. The chart is arranged so that the front draft gear is readily obtainable for a given hank roving, and with the stock weight at the forming zone always at 11½ grains per yard. (Digest of results obtained in thesis work of T. A. Hendricks, graduate fellow, N. C. State College, as published by *Textile Forum*, June 1951).

DIFFERENTIAL DRAFTING FOR SLIVER REGULARITY

A device for regulating the draft during the drawing of fibers to offset irregularities in the sliver is claimed. The sliver is first immersed in a tank containing an electrolyte or a colloidal solution of graphite or metal to make the sliver temporarily electrically conducting. The sliver is then passed between grooved feed rollers driven by an electric motor, contact rollers, and the drawing rollers also driven by an electric motor but at a slightly higher speed than the feed rollers.

The current supplied the motor of the drawing rollers is regulated by a controller in proportion to a current flowing through a circuit part of which is formed by the portion of the sliver which lies between the contact and front rollers. This control current depends on the electrical resistance of the sliver, and the electrical resistance is dependent on the number of fibers of which the sliver is momentarily composed. Thus, the sliver is subjected to greater draft when the number of fibers increases and to reduced draft when the number of fibers decreases. (*Textile Manufacturer*, March 1951).

PREMIXING AND REBALING ASSURES THOROUGH BLEND AT FIELDCREST BLANKET MILL

Inadequate mixing at Fieldcrest blanket mill led to production troubles such as streaks in the filling of plaid cotton blankets. Limited space in the opening room precluded large mixings.

Fieldcrest solved the problem by adding a separate mixing room which is used along with the opening room to provide a thorough mix in far less space than would be required for an opening room large enough to do the job.

The mixing room has five F-5 Saco-Lowell feeders, all of which feed to a apron leading to a vertical opener. Floor space permits running cotton from 50 bales at a time.

Cotton in 50-bale lots is taken to the mixing room, bales are opened and the stock fed to the feeders. After passing through the vertical opener, the stock is blown to a condenser, and then to a double press box.

At the press box, the stock is rebaled into standard, domestic bales. These bales represent a theoretical mix of 50 to 1, and are then returned to storage.

For raw stock dyeing, bales are opened, the

stock dyed as a batch, then rebaled in a press at the dyehouse. The dyed stock is returned to the warehouse and treated the same as baled cotton from the gin.

In other words, it does not go to the opening room, but goes again to the mixing room, where it is again mixed in 50-bale batches, rebaled, and returned to storage. This mixing assures correct blending and shading in the dyed raw stock.

The colored stock and the premixed white are now ready for the opening room.

By proper selection of bales from the first premixings, the mill can obtain a theoretical mix ratio as high as 7,500 to 1. But this is unnecessary. The mix ratio for the opening room need not be that high. However, the important gain from the new system is that it provides any degree of mix required.

Labor cost of baling after mixing is said to be about 80 cents a bale. (Extract from *Textile Industries*, June 1951).

MACHINERY HIGHLIGHTS OF BASLE SHOW

New Let-Off

A new warp let-off motion by George Fischer Ltd. consists of a feeler which rests on the beam and which, with the decrease of the warp diameter, release a coiled spring connected to a brake band.

It is claimed that the new let-off is fully automatic and easily adjustable. If set correctly on the full warp, it will maintain the same tension throughout the weaving of the warp without attention.

The let-off has been used on looms weaving both light and heavy cotton fabrics, and on linen, wool, and rayon cloths.

In order to avoid oil-stains on the warp, the motion is fitted with ball bearings which do not require greasing after installation. The linings of the brake band is a special type of fabric, and the motion can be disengaged quickly by hand. British agent for Fischer: Halmac Textile Machinery Ltd., Manchester, England.

Suction Clearer for Spinning

A new type of suction underclearer for spinning and other processes was introduced by the Swiss firm of Sulzer. Instead of a pipe containing orifices, the equipment uses a small protruding plastic nozzle which fits closely to the bottom roller and is claimed to prevent "lashing" of broken ends into adjacent ends, and at the same time, to cause less interference when the spinner is piecing broken ends. Filter and motor for the pneumatic clearers are incorporated in a suitable package.

New Spinning Frame

Pneumatic rollers which eliminate the use of weights on spinning rollers and modification in method of controlling tension highlighted Rieter's new spinning frame. The pneumatic roller provides "weight" that can be adjusted to meet varied requirements by means of a regulating valve.

The Rieter frame has an ingenious arrangement of movable spindle rail, ring rail, and thread guides. The movable spindle rails reduces the differences in size of the balloon at the beginning and completion of the doff.

During spinning, in addition to the movement of the ring rail for winding, there is a fraction of an upward movement during each traverse. At the same time, the spindle rail is lowered according to the increase in size of package; and the thread guides are for a short distance also traversed.

But, as soon as the best spinning conditions are reached, the thread guides remain stationary and, for the rest of the bobbin, the balloon remains almost constant.

Automatic Yarn Strength Tester

For the second year, the new Zellweger yarn strength and elongation testing machine demonstrated a capability of performing hundreds of tests entirely automatically. Besides recording the results graphically on a paper chart, the machine builds up a variability curve in the form of a solid diagram which can be quickly copied any number of times either photographically or by mechanical means. (Abstract from *British Rayon and Silk Journal*, April and May, 1951).

MILLS REPORT ON AUTOMATIC BUILDER MOTIONS

Mill No. 1:

We have one mechanical builder motion of the type recently put out by a prominent loom manufacturer. We find that it tends to provide a more uniform package size and more yards to the package.

Spinners do not have to watch the frame closely when it is nearly time to doff. The mechanical builder motion should enable battery fillers to handle more yarn since the bunch or wrap can be placed at the top of the quill.

Mill No. 2:

We have an automatic builder of the mechanical type which operates with cams and is driven from the head end gearing of the frame.

We first installed this builder on a frame of 3s filling. We attempted to run our bobbins without a bunch at the top, but could not get the rail to leave the top of the bobbin quickly enough to make a good bobbin. We then changed the builder to a frame of 11s filling and set it up to give us a bunch at the start and also one at the top of the full bobbin.

We could not get the rail down fast enough on this frame with the gears and cams that were on the builder. To correct this trouble, we speeded the drive of the builder about 100 percent and built up the pull-down cam in our shop until we got the rail to pull down with a maximum of 12 wraps from top to slacked-end position.

With these changes, the builder will now put a bunch on the bottom, run the bobbin full, put a small bunch on the top of the bobbin, pull the frame when full, stop the frame with ends already slacked in doffing position, and wind the rack all by itself. All the doffer has to do is to doff and start the frame.

No checks were made on the battery fillers using this yarn, but the weave-room overseer reports that the battery fillers like the new bobbins because all the doffs are exactly the same. (Excerpts from "Cleaning, Spinning, Controlling Problems Discussed by Georgia Men", *Textile World*, June 1951).

NEW LOOM ATTACHMENT WEAVES EXTRA-TIGHT, WATERPROOF COTTON FABRICS:

An improved, inexpensive loom attachment for weaving extra-tight, naturally waterproof cotton fabrics has been developed at the Southern Regional Research Laboratory in New Orleans, La. In recent research this device, a new model of the loom attachment developed previously by the Laboratory, has also proved valuable in weaving conventional fabrics, especially hard-to-weave fabrics like high-thread-count print cloth, according to Dr. G. E. Hilbert, chief of the U. S. Bureau of Agricultural and Industrial Chemistry.

He said the new model of the attachment is suitable for wide industrial use because of its practicability and low cost. It is constructed mostly of standard loom parts, and can be built at a very reasonable price. Furthermore, it is easily installed on standard textile looms and is simple to adjust and use. The Laboratory has thoroughly tested the device in weaving fabrics of both normal and high density.

Identical lots of broadcloth, print cloth and light duck of normal density, that is, having the usual number of picks per inch, were made with and without the attachment for comparison in the gray goods before dyeing and finishing. Those woven with the device had the better appearance; they were more uniform, showing practically no reed marks, and were 3 to 10 percent stronger. In weaving these fabrics, the Laboratory found that the attachment improved the general operation of the loom by easing the strain on the warp yarns.

The attachment also makes possible the insertion of up to approximately one-third more picks than can be obtained without it, resulting in fabrics of such abnormally dense construction that they resist the penetration of water and require no chemical or other treatment to make them waterproof. Tarpaulins made of this high-pick type of fabric, woven in the textile unit of the Southern Laboratory, are now being service-tested as covers on a New Orleans athletic field where they are subjected to unusually heavy rainfall. So far they have not leaked and the indications are that they are entirely satisfactory for this and similar outdoor uses, where resistance to the penetration of water is a primary requirement.

Dr. Hilbert said engineering drawings of this new loom attachment, together with samples of the experimental fabrics produced, are available to interested cotton mills and other organizations. Requests should be addressed to the Southern Regional Research Laboratory, 2100 Robert E. Lee Boulevard, New Orleans, 19, La. *(USDA Release No. 1551—51).*

THE THEORY OF CARDING

The principles of carding in use today are the same ones that were developed and used in England some 200 years ago. No change of major importance has occurred in the top flat card since the adoption of revolving flats about 1890 after many years of trial. While revolving flats did reduce the labor required to process a given amount of cotton, they did not necessarily improve the quality of carding. Some old experienced carders have claimed that better work was produced in cards with stationary flats.

The early theories of carding must be considered inadequate to explain such questions as:

1. Why does the cylinder of a card load during operation?
2. Why does the doffer load during operation?
3. Why are accurate settings necessary be-

tween cylinder lickerin, cylinder and flats, cylinder and percentage plate, cylinder and doffer and cylinder and under screens?

4. Why does a cylinder speed of 165 rpm necessarily give the best results?
5. Why does the centrifugal force of the cylinder not throw the fibers back on the lickerin or on the flats?
6. Why are the present types of card clothing satisfactory?
7. Why does a card operate when its cylinder is covered with non-flexible clothing which is similar to the covering of a lickerin?
8. Why does a continuous stripper on a cylinder cause a card to operate satisfactorily, in some instances, even though it tends to dull the wire on the cylinder?

While today the lickerin is considered the most effective cleaning unit used in cotton processing, this member was added to the carding engine to speed operation and eliminate the need of feeding the machine by hand. The original purpose of the lickerin was to deliver fibers mechanically to the cylinder at a uniform rate. In the development of the lickerin, it was found that additional cleaning of the stock in process could also be obtained.

It is evident that air currents which originate in the carding engine are known to affect the operation of the machine. It is axiomatic that the air surrounding the carding engines is subject to changes in pressure, temperature, and humidity. Investigation indicates that the surrounding air pressure is not an important factor in the carding operation, since satisfactory work is obtained with the same speeds, settings, and accessories whether the carding is done at sea level, at an elevation of 1,000 feet in Atlanta, Georgia, or at an elevation of over 8,000 feet in LaPaz, Bolivia. On the other hand every practical carder knows that the temperature has a decided effect on the operation of these machines. Several carders have stated that very unsatisfactory work is obtained when the room has a temperature less than 50° F. Humidity is also an important factor in carding and a relative humidity of 50 to 55 percent is generally recommended.

Study of the physical properties of air indicates that viscosity is one of its properties which is independent of pressure but which does change noticeably with temperature. Changes in relative humidity do not affect the viscosity of air materially in the range of temperatures in which carding normally occurs.

Since the cylinder of a carding engine may be considered to rotate in a reservoir of still air, according to the Boundary Layer Theory, a series of concentric layers of air of infinitesimal thickness surround the cylinder. The velocity of the layer on the cylinder will be zero relative to the cylinder but will be the same in relation to the stationary reservoir as the surface velocity of the cylinder. The velocity of each successive layer becomes less as its distance from the cylinder increases, until a layer is reached in which the velocity is zero.

Reasons begin to appear to indicate why accurate settings are necessary on a carding engine, when it is realized that the cover plates, the top flats, and the screens form a perimeter to control the boundary layer of air which surrounds the cylinder as it rotates. At this perimeter, which is at the base of the wire in the flast, and at the surface of the screens, the velocity of the air will be zero. Because the strata of air which surround the rotating carding cylinder have such different velocities, the fibers which are introduced into this boundary layer are subjected to a terrific force caused by the shearing of the air. (Extract from *Whitin Review*, Mar.-April, 1951).

MACHINERY HIGHLIGHTS OF LILLE TEXTILE SHOW

The big hit of the Lille show to most folks were the circular looms and the shuttleless looms. There were three of the former and two of the latter, all running (though one of the circular looms was on a dry run with no yarns).

All three of the circular looms are French. That of the Turboloom Corp. ("SAGEM") and the one of Saint Freres were very similar in design. The loom itself is in the center, fed by two loom beams, one on each side. These each feed to half the circle of drop wires, and from there into the center. Four shuttles run continuously around the outside of the tube of fabric, which passes below into the basement as it is woven, and is there wound on a beam. The shuttle holders push the yarn into place, eliminating the need for a reed. The heddles are in five-inch sections on a circle just inside the drop wires, actuated by cams from below, and move so fast it is hard to watch the sequence of operation.

It was fascinating to watch the Saint Freres loom in operation, weaving jute bags at the rate of 400 picks per minute (450 picks per yarn). At the rate of about one-half inch per second, the fabric really flows out of the loom. They have a number of looms in mills at present, using one

weaver to four looms, but should be able to use more. With the heavy jute there is comparatively little yarn breakage, and only 30 seconds were required to replace four shuttles when they ran out. The shuttles held 3½ lb. and ran about 20 minutes. Mr. Bride, who was with the machine, said they sell at about $3,000. They have been developing the loom since 1934, and say they hope to have one for cotton within a few years.

The two main difficulties confronting them in weaving lighter yarns are the fact that the present looms run under fairly high tension, and that to run a much finer fabric would also require many very much smaller parts in order to crowd everything into the same space. But for jute baggings, the loom seems ideal.

The general principle of the Fayolle loom is similar. In it, the bagging moves up instead of down, and the shuttles (two in number) run around inside the bag as it is woven. Instead of small sectional heddles, the heddles are two circluar pieces, operated by four arms which move in such a way as to chase the shuttles around. This gives a very much simpler mechanical section that the complicated cam set-up of Saint-Freres and "SAGEM", but with only two shuttles weaves about half as fast. They claim it takes 10 seconds to change the shuttle. I watched the girl—she did it in six, from the time the loom stopped till it started again. A one hp motor is required.

Shuttleless Looms. The shuttleless looms were of two types. Either one was capable of weaving any type of yarns and practically any sort of pattern.

The Sobretex loom operated by a large "needle" on the end of a rigid metal bar, the other end which was actuated by a gadget which looked like a light magnesium picker stick. This needle picked up a filling yarn (which unwound from a large cake at the side of the loom), carried it to the center of the shed, where it was picked up by a similar needle which had come in from the other side, and which carried it back the rest of the way across the cloth, releasing it with about a third of an inch sticking out beyond the selvage.

They claim at present a speed of about 360 picks per minute, and say they are working on a loom capable of doing 500. They also claim they can operate 35 looms with one weaver and one helper. The present loom weaves comparatively narrow fabrics as a limit (about 40 inches), but they can increase this by a change in the bar which pushes the needles.

The Ballbe shuttleless loom operates by pushing one yarn doubled all the way across the shed, looping it around a wire which holds the yarn till the shed changes. It was weaving a 100-inch plaid at about 70 picks per minute, but these were double picks giving an equivalent of 140 picks, which isn't bad for 100 inch goods. The gadget that pushes the yarns across is on the end of a flexible steel ribbon, which winds on a large wheel as it comes out of the shed.

Either loom can, of course, have any sort of warp pattern, and a number of filling colors, by use of a selector which pushes the proper thread into place as each pick is being made. The Ballbe loom feeds filling from both sides alternately; the Sobretex feeds it always from the same side.

Both looms, of course, have the disadvantage of imperfect selvages. Still, where most of the goods are dress goods or for similar cutting, the selvage is generally cut away anyhow, and not important.

Both of the shuttleless looms run very quietly, and the circular looms make no more noise than a spinning frame.

All through the show I got the impression that even if the Europeans were not up with us on production methods, it was certainly not the fault of their machine designers. They're not behind us there, and in some ways are ahead. For instance, I had seen the Swiss Ruti loom some twelve years ago with on overhead harness mechanism. Now practically all the European looms have the heddles actuated from below, leaving the top of the loom perfectly clear. And on most, the heddle frame is of aluminum, rather than wood. Generally, in actuating from below, rigid links are used, which are not subject to deformation and require no adjustment once set.

All the spinners seemed to be interested in the comparatively new German ring spinning frame of Spinnbau B.m.b.H. The conventional tapes are eliminated and replaced by plastic helical gears which drive the spindles. These gears are all on one shaft along the side of the machine, and enclosed under the spindles, are loose on the shaft and turned by a metal centrifugal clutch which is fastened to the shaft. This holds the gear just tight enough to turn so that the spindle may be stopped to repair breaks as desired.

The ring rail is stationary, and the spindles ride up and down on the drive box. Spinnbau claims that the stationary ring rail gives a more even yarn tension and a constant balloon, which makes up for any irregularity in the motion of the traveler, as far as yarn tension is concerned.

A two-speed motor is used, driving a shaft having a pyramid of gears in the transmission. Speed can be chosen to give any one of twenty speeds, and with the two-speed motor, a total of forty speeds. The gear change mechanism is operated by a special key so that it cannot be tampered with. (Extract from *Textile Industries*, June 1951).

MILL REPORTS ON UNDERFRAME CLEANERS

Six under-frame cleaners have been in operation on warp spinning for nearly a year. The mill averaged about 25 percent fewer ends down.

There was no change made in traveler-changing schedule, but less changing could be obtained, as one of the features of the cleaner is that the travelers do not load up. The fewer ends down were attributed to less loading up of the travelers.

The mill blows out and cleans out the cleaners every 24 hours. (Frames without cleaners are blowed off every two hours). Maintenance amounts to about 5 minutes per day, per cleaner.

Special warps run from yarn spun on frames with the new cleaner showed considerably less gouts in cloth than regular warps.

Increased traveler life and less loading of tapes were reported from installations of the cleaners at other mills. (Condensed from "Cleaning, Spinning, Controlling Problems Discussed by Georgia Men", *Textile World*, June 1951).

STUDY OF TWIST UPON TWO-PLY YARNS RESULTS IN INTERESTING DATA

A study of the effects obtained in twisting together two single yarns to form a ply yarn showed the following conclusions: 1, there was a definite correlation between skein and single-end breaking strength of ply yarns; 2, elongation of yarn at rupture point depends upon pretensioning of the load.

Among other results, the study developed the strength ratio between balanced two-ply yarns and the single yarns from which they were produced. This ratio was found to remain constant regardless of yarn size and increased uniformity with increases in the residual single-yarn twist and the balancing ply twist. However, the rate of increase was greater for the coarser yarn.

Graphs showed the value of this ratio. It increased from 2.06 to 2.36 when ply twists were used to balance single-yarn twist multipliers of from 3.75 to 4.50.

A similar study of unbalanced two-ply yarn disclosed that this ratio will approach figures of 2.75 and even 3.00 in finer counts.

These results were highlights of research that was intended to determine the influence of twist upon the physical characteristics of balanced two-ply yarns: strength, twist contraction, yarn diameter, twist angle, elongation, and density. (Results of thesis by Gerald Zobel, N. C. State College, as published by the *Textile Forum 8*, June 1951).

HOW TO REDUCE YARN DEFECTS

Most defects that show up as slubs, gouts or lint buttons are products of the spinning room. More defects are caused by blowing off with an air hose than by all other causes combined.

In one mill, defects were reduced more than 50 percent by eliminating all blowing off of the overhead, base rails, ring rails, idler pulleys, motors, and overhead cleaners.

This mill did not give up compressed air in one sudden decision. They formerly used as much compressed air as any mill, and even after the installation of overhead cleaners, they continued to blow down every 12 hours.

But after mounting fans on the overhead cleaners, the mill discontinued blowing down of the overhead, and then stopped the blowing off of frames, spindle rails, and motors.

Substitute methods for the former compressed-air blow off are: a brush, revolving picker, and mop.

Time studies showed that a small 1½-inch-diameter brush does as good and as quick a job of cleaning spindles as the air hose. Now, spindles are cleaned by the brush method every three shifts.

Idler pulleys are cleaned with a revolving picker equipped with an extra long shaft which reaches down to the pulley with ease. Motors are cleaned with a mop.

Other spinning defects may be caused by carelessness on the part of spinning operatives, and the mill follows an intensive training program for these employees so that they become well aware of the results of their work. Defects caught in the spooler room are shown to the spinning employees. (Digest from *Textile Industries*, June 1951).

THE UNORTHODOX IN LOOM DEVELOPMENT

In so far as the less orthodox approach to the problem of producing cloth in quantity at economic prices was concerned, two outstanding machines were demanding consideration today,

said Mr. E. Cotterill of Courtaulds Ltd., in a recent lecture given before the Braintree and District Textile Society. These were, he said, the Sulzer loom, a shuttleless loom in the normal sense in that it wove multi-width cloth at higher speed from endless weft supplies—and the Fayolle-Ancet circular loom.

Before describing these machines, however, Mr. Cotterill asked his audience to consider the sacrifices which any departure from the normal shuttle and pirn involved. Primarily, he said. it meant either a possible inferior selvedge or the loss of the selvedge altogether. As a selvedge had some commercial value, the consequence was that cloth produced by unorthodox machines must be saleable at a slightly less cost than normal cloth to overcome the selvedge prejudice. Then, if the selvedge shortcoming did not adversely affect dyeing and finishing, there should be no objection to cloth produced on such machines.

The reasons for the high speed and production of the Sulzer loom were, he said, threefold. Firstly, there was the modified timing diagram. The shuttle boxes were divorced from the reed and beat-up and were stationary, while the reed moved very rapidly as soon as the shuttle had passed across. Secondly, the small shuttle, inserting single picks of weft, called for small sheds and reduced picking forces. The picking mechanism was, in fact the smallest known. The shuttle was positively guided and was picked from only one side of the loom, being conveyed by means of a belt to the picking box. Thirdly, the high shuttle speed was used to full advantage by weaving wide cloth. In every way, the loom was a modern loom.

At this point, Mr. Cotterill said it was worth speculating on the wider use of multiple width weaving. For instance, 90 in. reed space looms working at 120 picks per minute and weaving two widths of dress fabric could be substituted for single width looms at 160 picks per minute in the ratio of at least four wide looms to six narrow, the equivalent picks per hour from a given floor space being the same. The lower speeds might, he said, help the overlooker (fixer) considerably, especially as he would have fewer looms to look after. Money would be saved on the installations, and the actual yardage per weaver and per overlooker might easily rise appreciably. He was informed, he said, that a Scottish firm had actually installed a weaving unit on these lines.

Unfortunately a loom of the Sulzer type was costly and difficult to manufacture on a mass-production scale. Despite several years' development work, Mr. Cotterill said only a comparatively small number was installed and working in America.

In concluding, Mr. Cotterill said in a review such as this, the detail of individual motions tended to be obscured and, to keep the main objects of scrutiny in focus, it was necessary to generalize. The changes which were being witnessed in loom design were mainly directed towards increasing the degree of automatic operation and the problem resolved itself in the simplest construction and to a degree of mechanical perfection that would give reliable operation at high speeds.

Mr. Cotterill said he suggested that, in considering the looms per weaver aspect, one eye should be kept on the overlooker. His position tended to become complicated by the increase of mechanism on many modern looms and a return to the simple approach might pay dividends in reduced all-in weaving costs. A more looms per overlooker policy, or possibly a new approach to overlooking through a specialization of his duties, might conceivably develop, judging from a study of current trends in weaving machinery design.

The more thought one gave to this aspect of loom design the more respect one had for the American approach and the less one appreciated the elaboration of the Swiss and Continental makers, said Mr. Cotterill. There was much to admire in the Swiss loom but, to his mind, the Continental elaborations were not essential to the weaving of good quality cloth. We might, he said, call the American approach a more positive attitude in which the place of the loom in the general plan of making large quantities of cloth at economic prices to a good quality standard had been more completely realized and related to the other factors of labor, capital, material and design. (Extract from *Textile Recorder*, April 1951).

SELF-STACKING FILLING CANS

Filling cans have no claims to novelty, but an interesting improvement in the construction of these cans is reported from Thompson Textessories, Lancaster, England.

The new filling can is a nesting type made from high strength aluminum alloy. The design is such that they can be safely arranged in stacks when full without causing any damage to the contents. Available in varied sizes. *(British Rayon & Silk Journal,* April 1951).

NEW TOW TO YARN PROCESS

The process involves the drawing of tow of continuous filaments so as to break the filaments

while spinning them into a staple yarn. The apparatus, in common with other spinning devices wherein yarn is spun by machinery, includes a muliplicity of weighted rollers, succeeding sets of rollers being operated at higher surface speeds than the preceding rollers. A characteristic feature of the present invention resides in the inclusion of process steps and mechanical means whereby tow may be continuously broken and drafted into filament yarns having a relative fineness in relation to the tow in the order of from two to one to several hundred to one.

In experiments with continuous filaments, it was found that great difficulty is encountered in securing a high degree of uniformity of evenness with respect to the number of fibers in cross sections of the spun yarn and it is one of the objects of the present invention to produce such uniformity.

It was also found that the difficulty in securing uniformity in the spun yarn may be overcome by conveying the undrafted (that is to say the unbroken) tow from the slow moving back or holding rollers to fast moving front rollers in such a manner as to permit unrestricted breaking of the individual fibers in the tow while preventing the free ends thereof from being moved from their proper positions. In accordance with this invention a tow of continuous synthetic filaments is broken into numerous short length filaments, preferably between two sets of rollers operating at different speeds, which short length filaments are then separated and conveyed by an apron through a self-feeding funnel or concentrator directly to the spinning machines.

In the preferred arrangement the means for holding the tow while it is being broken may include a pair of lower rollers operating at the same speed or with a slight differential in speed, the back roller of the pair operating somewhat more slowly than the front roller, these two lower rollers supporting an upper roller preferably covered with a soft rubber covering material, the upper roller being weighted upon the lower drafting rollers and being driven by them due to frictional contact. The conveyor apron may, if desired, be actuated by one of these lower rollers so that material passing underneath the rolls will be conveyed to the breaking rollers, which latter rollers are arranged at a suitable distance apart from the holding and feeding rollers. This distance may be varied from several inches to several feet, depending upon the character of the yarn desired. It has been found that this distance has a direct bearing upon the distribution of fiber length within the finished yarn. (USP 2,523,854 Herbert J. Woods.)

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